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THE *Robert Luedeking.*
AMERICAN YEAR-BOOK
OF
MEDICINE AND SURGERY

BEING

A Yearly Digest of Scientific Progress and Authoritative
Opinion in all Branches of Medicine and Surgery
drawn from Journals, Monographs, and Text-
Books of the Leading American and Foreign
Authors and Investigators

COLLECTED AND ARRANGED

WITH CRITICAL EDITORIAL COMMENTS

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UNDER THE GENERAL EDITORIAL CHARGE OF

GEORGE M. GOULD, M.D.

MEDICINE

PHILADELPHIA AND LONDON

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1905

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PREFACE.

NOT only the YEAR-BOOK and its readers, but the American profession and people have suffered a great loss in the death of Dr. S. W. Abbott of Boston. His manuscript had been received and the proofs had passed through his hands before his death. His department in our work—that of Public Hygiene and Preventive Medicine—will next year be in the charge of Dr. John S. Fulton of Baltimore, at present the Secretary of the State Board of Health of Maryland, and Editor of the Maryland Medical Journal. Subscribers may therefore feel assured that the advances in hygiene will be perfectly collated and edited. Dr. J. Leslie Davis begins this year his connection with the work, in conjunction with Dr. Kyle, in the department of Laryngology, etc., in place of Dr. Fetterolf, who has resigned.

In view of many works similar to this one epitomizing the advances made in Medicine and Surgery which have been undertaken since the YEAR-BOOK was started, it is a source of gratification to know that the members of the profession continue to show their appreciation of the conscientious and hard labor put into their difficult task by the departmental editors of the AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY. With the unchecked increase of the amount of our literature the difficulty grows continuously greater of keeping the size of the volumes from becoming too bulky.

GEORGE M. GOULD.

CONTENTS.

GENERAL MEDICINE	PAGE 9
By ALFRED STENGEL, M.D., and D. L. EDSALL, M.D., Philadelphia, Pa.	
PEDIATRICS	229
By J. P. CROZER GRIFFITH, M.D., and J. CLAXTON GITTINGS, M.D., Philadelphia, Pa.	
PATHOLOGY AND BACTERIOLOGY	295
By DAVID RIESMAN, M.D., and A. O. J. KELLY, M.D., Philadelphia, Pa.	
NERVOUS AND MENTAL DISEASES	363
By ARCHIBALD CHURCH, M.D., Chicago, Ill.	
CUTANEOUS DISEASES AND SYPHILIS	425
By LOUIS A. DUHRING, M.D., Philadelphia, Pa.	
MATERIA MEDICA, EXPERIMENTAL THERAPEUTICS, AND PHARMACOLOGY	469
By REYNOLD WEBB WILCOX, M.D., New York City, and A. A. STEVENS, Philadelphia, Pa.	
PHYSIOLOGY	517
By G. N. STEWART, M.D., Chicago, Ill.	
LEGAL MEDICINE	545
By JOHN MARSHALL, M.D., Nat.Sc.D., and J. H. W. RHEIN, M.D., Philadelphia, Pa.	
PUBLIC HYGIENE AND PREVENTIVE MEDICINE	579
By SAMUEL W. ABBOTT, M.D., Boston Mass.	
PHYSIOLOGIC CHEMISTRY	620
By WALTER JONES, Ph.D., Baltimore, Md., and REID HUNT, M.D., Washington, D. C.	

GENERAL MEDICINE.

BY ALFRED STENGEL, M.D., AND D. L. EDSALL, M.D.,
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SUMMARY OF GENERAL MEDICINE.

The most striking work of the past year, and that which is most likely to have permanency, will be found in the interesting studies on trypanosomiasis and sleeping-sickness. There has again been an enormous amount of work, much of it of great interest, and some of it probably of permanent importance, on tuberculosis. The nature of diabetes has also excited an unusual amount of investigation; and another subject that has been conspicuous during the past year is abnormalities in the rhythm of the heart.

In detail the special papers that are particularly worthy of inspection are the following: In typhoid fever those relating to the source of the disease, a number of interesting articles on the symptomatology of that disease, and a suggestion of possible value concerning blood-pressure changes at the time of perforation in typhoid.

In tuberculosis, Behring's articles are of great interest; although his conclusions must be accepted with caution. An important paper is that of Macfadyean and MacConkey in relation to tubercle bacilli in the mesenteric glands of apparently nontuberculous persons. Many important articles dealing with the source of tuberculous infection will be found; and other papers on this great subject that should receive attention are several relating to the diagnosis, and that of Maragliano concerning the serum treatment.

Articles on epidemic pneumonia, statistical papers concerning this disease, and articles on its physical signs and on the simulation of abdominal disease by pneumonia and pleurisy are worthy of note.

Interesting observations concerning the prophylaxis of malaria have been made. Anderson has done some important confirmatory work concerning the parasite of the Spotted Fever of the Rocky Mountains; Schleip has contributed an extensive study of trichinosis; the observations on trypanosomiasis and sleeping-sickness referred to above are numerous and intensely interesting; and the papers on the Leishman-Donovan parasite are important.

Lion furnishes an observation on levulosuria that is of clinical importance. The work of Cohnheim and Hirsch on the nature of diabetes and the observations concerning the glycolytic ferment are of theoretic

interest, while v. Noorden's experience with oatmeal in the diet of diabetics is of clinical value.

Krause has made a study of the lesions of gout, which may prove to be of much interest in relation to the nature of this disease; and clinical articles by Toogood and others are of importance.

Magnus Levy's study of myxedema is an extremely valuable one, and there are interesting articles on the nature and the symptomatology of arthritis deformans. Quinke and Gross have given an interesting study of odd forms of acute transitory edema.

Under diseases of the blood will be found some matters of interest concerning methods of examination, on the nature of leukemia and, particularly, the x-ray treatment of that disease; and on pernicious anemia. Chronic cyanosis with polycythemia has been extensively discussed as a new entity by Osler.

Diseases of the cardiovascular system includes a valuable clinical article by Hoffmann, and some interesting studies of cardiac conditions by De la Camp and others. The abnormalities of rhythm have been discussed at length, especially with reference to the teaching of Engelmann concerning the myogenous origin of cardiac action. These studies are very interesting, but are based largely upon theory, and a theory that will soon be forcibly attacked in this country; and the clinician can scarcely, as yet, gain much of value from these methods of observation. The papers on the reduction of fluids in the treatment of cardiac conditions, several papers on blood-pressure, a number on arteriosclerosis, and the paper of Sailer and Pfahler on tortuosity of the aorta should be noted.

Boas's study of occult hemorrhage in gastric ulcer, the discussion on the treatment of ulcer at the British Medical Association, and a number of papers on the diagnosis of gastric cancer are valuable. Some interesting observations in regard to dysentery and disease of the bile-passages have been made, while Cammidge's observations on the chemical diagnosis of disease of the pancreas have aroused much interest.

There have been a number of important observations concerning examination of the urine, pigmented urine, and albumosuria; while valuable contributions on albuminuria have been made. The paper by Trautlein on bacterial destruction of casts in the urine should receive the attention of the clinician.

Among intestinal parasites, the uncinaria naturally has received especial attention, and is at present of chief importance to Americans. A number of important papers on this subject have appeared within the past year. Stiles's observations regarding the dwarf tapeworm are likewise of interest to clinicians in this country.

The study of parasites has, indeed, provided the chief landmarks in the field of investigation in the past two years, as may readily be seen by noting the work reviewed in this volume and the last in the Sections on General Medicine and Pathology.

INFECTIOUS DISEASES.

TYPHOID FEVER.

Schuder¹ discusses the various sources of typhoid epidemics, and decides that 70.8 % are due to water-infection; 17 % to milk-infection; and 3.5 % to infection in other forms of food, while various other causes each produce a small part of the remainder.

J. S. Fulton² discusses some hindrances in the prophylaxis of typhoid fever, and emphatically insists upon his belief that the disease is frequently called by other names, particularly in the South. He also says that the disease is **far more important in small communities and in rural districts** than it is usually considered to be. He discusses the returns of the Twelfth Census, and finds that rural typhoid fever is credited with 6 out of every 1000 deaths, as against 38 out of 1000 for urban typhoid. He considers certain details of this census, and decides that less than 65 % of cases of typhoid causing death are actually recognized as such. A large number of the deaths attributed to malaria are, he thinks, due to causes in which malaria has no part. The **propagation of typhoid fever** is, in general, **from the country to the town** rather than from the town to the country; and one of the most important points in controlling the disease is to insist upon proper hygienic measures in rural districts and small communities.

R. Weil³ gives an interesting description of the work in which, with others, he has been engaged, in a field laboratory; investigating the epidemic of typhoid fever that occurred in the village of Ratsweiler, Germany, and that vicinity. He gives a chart of the cases of typhoid as they appeared, with their relation to the water-supply and to one another; and comes to the conclusion that **the epidemic traveled from house to house and was an instance of contact-infection** rather than of infection through the water-supply or other similar source. The epidemic ran for 5 months and crept from house to house, heedless of independent water-supplies, etc.; and in most of the instances there was evident opportunity for contact-infection. Weil particularly insists upon the importance to those caring for typhoid-fever cases of being rigidly careful about disinfecting their hands and other similar measures, especially in relation to children, and of avoiding the infecting of dung-heaps, etc. Excreta should be immediately subjected to disinfection. He is strongly **impressed with the importance of contact-infection** in typhoid.

P. B. Barringer⁴ considers **passengers on railroad trains to be an important source of typhoid infection** on account of the open deposition of excrement—at times directly into the water-supply of towns or cities. He believes that his observations have demonstrated that

¹ Zeitsch. f. Hyg. u. Infektionsk., Bd. xxxviii, S. 343.

² Jour. Am. Med. Assoc., Jan. 9, 1904.

³ Med. News, Feb. 20, and Mar. 5, 1904.

⁴ Med. Rec., Dec. 19, 1903.

there is a particular tendency for typhoid to occur after prolonged railroad journeys or in those who customarily travel a great deal; and he states that in railroad hospitals a large proportion of the cases of typhoid fever are found among the "trackmen." This he attributes to their swallowing a large amount of dust from the infected tracks, or to this dust getting into the drinking-water and food. He thinks that there should be definite regulations prohibiting the deposition of excrement along railroad tracks.

H. H. Tooth,¹ in discussing typhoid-infection in camps, emphasizes the importance of sand-storms and flies, and particularly that of "comrade-infection." He thinks that only 6 men should be accommodated in one tent.

T. F. Harrington² reports an epidemic of typhoid fever in Lowell, Mass., which was traced to a defective check-valve that permitted the water of the Merrimac River, contaminated with sewage, to enter the city water-supply. The epidemic was overcome by controlling this defect.

G. Newman,³ in discussing the sources of typhoid fever in London, presents evidence that water is not the most common source of infection. He emphasizes the importance of contact-infection and of infection through food, particularly shellfish. He describes a series of instances in which it seemed highly probable that infection had been due to contact. As to shellfish, he mentions a number of instances in which these were apparently active in producing the disease, and states that in all there were about 160 cases in which infection apparently occurred from this source. He believes that in London the main channels of infection are personal contact and polluted food.

A. Tjaden,⁴ after having made a study of the methods of heating milk to destroy pathogenic organisms, has reached the following conclusions: In large dairies the heating of milk for from one to two minutes at 85° C. is sufficient to kill the most important of the organisms present. Heating to this point produces changes in the milk, but these are not sufficient to be serious, except that, commercially, it is important that it is not possible to make satisfactory hard cheese of such milk. Heating the milk for an hour at 60° or 65° C. probably also kills the bacteria; and this causes changes that are so slight as to be negligible.

R. Bassenge⁵ discusses the behavior of typhoid bacilli in milk and the influence of heating the milk upon these bacilli. He reaches the conclusion that heating the milk for five minutes to 60° C. will suffice to kill all the typhoid bacilli in the milk. For this purpose earthenware vessels are more satisfactory than those of iron or enamelware, as the heating occurs more slowly. The development of acids in the milk will kill the typhoid bacilli when the acid-content goes above 0.3 % or 0.4 %, and when the acid has acted longer than 24 hours. If the acids are above this point in buttermilk and in butter, the typhoid

¹ Practitioner, Jan., 1904.

² Jour. Am. Med. Assoc., Dec. 19, 1903.

³ Practitioner, Jan., 1904.

⁴ Deut. med. Woch., Dec. 17, 1903.

⁵ Deut. med. Woch., Sept. 17 and 24, 1903.

bacilli will be killed. Centrifugal cream contains most of the typhoid bacilli that have been present in the whole milk; and living typhoid bacilli may be present in butter and be virulent, particularly when the taste of the butter is excellent and there is no formation of the lower fatty acids.

C. Bruck¹ has made a study of the question of **typhoid infection through butter**. He first infected milk with typhoid bacilli, and then determined whether these bacilli were found in the cream, butter, and buttermilk afterward, and how long they could be found. In the second group of investigations he washed the vessels in which the milk was to be put or butter to be prepared with water that had been infected with typhoid bacilli. In the third group he did not use a pure culture of typhoid bacilli, but typhoid stools, to infect the water. This, he believes, gave the nearest approach to natural conditions. He found large numbers of typhoid bacilli in the cream from milk that had been infected, and also in the butter. In the second group of experiments he found many typhoid bacilli in the whole milk and the butter, and small numbers in the skimmed milk and the buttermilk. He found the bacilli in the butter for as long as 27 days. He believes that **butter may readily carry typhoid infection**, and that this possibility should always be considered when no other source of typhoid infection can be found. This is further evidence of the fact that typhoid may be spread in many ways; that all sorts of possibilities should be considered; and that there should be an attempt to control as many of these possibilities as is reasonable. It is further evidence, moreover, he thinks, of the truth of Koch's view that the right way to combat typhoid is to prevent the possibility of the infection's being spread from the human beings themselves who have the disease. After the infection has once been spread it is almost impossible to exercise absolute control over it.

C. F. Davidson² discusses the source of infection in a number of cases of typhoid fever that he observed in private practice. He particularly notes that 2 cases were probably due to butter that had become infected through being packed in pans, the **water used to wash** which had been **taken from an infected well**. This well had produced 6 cases of the disease at the farm upon which it was situated.

R. H. Hutchings and A. W. Wheeler³ report an epidemic of typhoid fever that occurred at the St. Lawrence Hospital, near Ogdensburg, New York. There were 39 cases in all, and the source of the **infection was finally traced to the ice used**, from which colonies of typical typhoid bacilli were isolated by G. F. Blumer. After this ice had ceased to be used in the institution the disease disappeared, in spite of the fact that the water was not boiled, and that the conditions, with the exception of the use of this infected ice, remained the same as at the beginning of the epidemic.

A. S. Grünbaum,⁴ in some studies of **typhoid fever in the chimpanzee**, states that he has not been able to produce any characteristic

¹ Deut. med. Woch., 1903, No. 26.

² New York Med. Jour., July 11, 1903.

³ Am. Jour. Med. Sci., Oct., 1903.

⁴ Brit. Med. Jour., Apr. 9, 1904.

lesions in ordinary monkeys, but that in the chimpanzee he has produced characteristic intestinal lesions and recovered the bacillus from the spleen after death.

J. A. Grober¹ observed that in a typhoid case that came to autopsy the spleen was in part greatly compressed by the left lobe of the liver, and that the compressed part showed none of the swelling usual in typhoid spleens, while the other portions of the organ were swollen as usual. This led him to study the old question whether the enlargement of the spleen in such conditions is due to hyperplasia or to simple hyperemia. He compared the spleens of normal animals with those of animals infected with streptococci, taking as standards of comparison the weight of the spleen as compared with the total bodily weight; and he also determined the amount of water in the spleen as an indication of the amount of blood present. He found increase in the amount of water with increase in the weight; and he decides that **enlargement is, in considerable part at least, and perhaps entirely, due to hyperemia.**

Symptomatology.—D. L. Edsall,² in discussing the **clinical behavior of the lymph-glands in typhoid fever**, says that, while they are not commonly stated to be enlarged in this disease, his observations on a series of cases have led him to the conclusion that in a large proportion of cases it may be determined clinically that widespread glandular enlargement does occur. It is usually of slight degree, but is sometimes sufficiently marked to be readily noticeable on palpation. Of 36 cases carefully observed, glandular enlargement apparently occurred in 25. This enlargement is perhaps of some interest in diagnosis; for example, in connection with acute tuberculosis and estivoautumnal malaria. Its diagnostic value, however, must be slight, as it usually occurs relatively late in the course of typhoid fever. In all the cases especially discussed recovery occurred; but this is not of much importance, because in all the fatal cases seen during this investigation complications such as furunculosis were present, and led to the exclusion of these cases from the series. Still, it is possible that the observation of marked and widespread **glandular enlargement may influence the prognosis favorably.** It was observed, however, that several cases relapsed after the occurrence of glandular enlargement; though after the relapse the glandular enlargement was usually more marked than in the previous attack. Edsall believes that glandular enlargement is much more common and more easily discovered in many infectious diseases than it is usually considered to be.

H. Curschmann,³ in discussing typhoid fever with **unusual course and sudden death in typhoid fever**, mentions a series of interesting cases of ambulatory typhoid. He especially notes that in the mildest form of the disease the patient may be free from fever, except at certain periods of the day when there has been particular strain. There may then be sudden rises of temperature, perhaps with chills; and the disease in such cases closely resembles malarial fever. The author also notes

¹ Deut. Arch. f. klin. Med., Bd. lxxvi, Hefte 4 u. 5.

² Amer. Jour. Med. Sci., April, 1904. ³ Deut. med. Woch., April 21, 1904.

a case that had been called chlorosis, and others termed cerebral or cardiac neurasthenia. Any of these cases may end with sudden death, particularly from hemorrhage or perforation. Among the cases of sudden perforation in mild typhoid he mentions one that had been called volvulus. He notes an instance in which there was a typhoid perforation of the appendix in an ambulatory case. Pulmonary embolus also sometimes causes sudden death; and, as an unusual cause of rapid fatality, Curschmann mentions a case in which abortion, followed by violent sepsis, occurred. There are likewise cases of **foudroyant typhoid and of hemorrhagic typhoid**, both of which run an extremely rapid course and cause death within a few days. At times the foudroyant character may be assumed in a relapse or recrudescence, when the previous course has been exceedingly mild. The same is true of the hemorrhagic form. At times the hemorrhagic form ends suddenly with meningeal hemorrhage. Of the 6 cases of hemorrhagic typhoid seen by the author, 3 occurred in children. Alcoholics are also predisposed. These cases are actually extremely rare.

H. L. Elsner,¹ in discussing anomalous typhoid fever, states that he has made a number of observations of the **blood-pressure in typhoid fever**, and that he has found it regularly low in ordinary cases. He considers blood-pressure determinations to be of no value in diagnosis, except, perhaps, in complications. Of 110 cases, he observed diarrhea in 84; nosebleed was seen in but 49 cases. The Widal reaction was seen in all but 8 of the 110 cases. He mentions a case in which extremely grave hemorrhage occurred before the eleventh day; and another in which fatality occurred on the ninth day from profound hemorrhage. In the **diagnosis between nephrotyphoid and typhoid complicated with preëxisting nephritis** he believes that blood-pressure determinations may be of importance. He notes that of 20 children, ranging from 10 months to 10 years of age, he observed a typical reaction in 65 %.

D. Riesman² discusses **desquamation in typhoid fever** and reports two special cases, mentioning others. He refers to the paucity of discussions of this subject in literature, and describes three types of desquamation: one confined to the roseolar spots; another appearing as the result of sudamina; and the third being an almost universal desquamation, probably due to trophic changes in the skin. [Desquamation is, in our experience, very common indeed, and even extensive desquamation, that may occur in large scales, is not very rare.]

L. Mohr³ contributes some studies of **metabolism in fever**, which, he believes, indicate that the tissue-destruction in simple fever shows no very marked qualitative changes.

J. McCrae⁴ contributes an **analysis of 717 cases** of typhoid fever observed in the Montreal General Hospital during a period of 5 years. In 12.96 % a previous attack had occurred. The Widal test was positive in 92.77 %; the diazo-reaction, in only 62.7 %. [The period at which this reaction was tried is not noted.] Rose-spots were seen in 65 %.

¹ Med. News, Jan. 2, 1904.

² Am. Jour. Med. Sci., Jan., 1904.

³ Zeit. f. klin. Med., Bd. lii, Hefte 3 u. 4.

⁴ Amer. Med., Sept. 26, 1903.

The spleen was palpable in 47.5 %. Constipation existed in 48 %; 13 % had normal bowel-movements. **Vomiting occurred in 10 %**; chill in 5 %. Abdominal pain was noted in 22.7 %, and probably occurred in more cases. The author states that 3 cases of cholecystitis occurred; 3 of glossitis; 2 of empyema; 1 of arthritis; 2 of myositis; 2 of paralysis; 5 of posttyphoid insanity; 2 of tetany; and 1 with a series of other complications. Hemorrhage occurred in 72 cases (10 %); of these, 26 were fatal. In 31 cases in which notes of the food were made 12 had had other than liquid diet before the hemorrhage. Perforation occurred 43 times; of these patients, 23 were operated upon and 6 recovered. McCrae insists upon the relative **importance of sudden pain**, and also upon the fact that rigidity is not always present early. He believes that operation should always be carried out in strongly suspicious cases. Forty-six per cent. of the cases showed albuminuria; 28.2 % casts. There was 1 case in a child under 2 years of age. The average duration in children was 20 to 21 days. Children less commonly showed rose-spots, hemorrhage, perforation, bronchitis, albumin, and casts; and more commonly, delirium, relapse, and recrudescence. In comparing the results of treatment with baths, antipyretics, and sponging, he reaches the conclusion that these cases showed no marked distinction in favor of any form of treatment, except that **hemorrhage and neuritis occurred more commonly in those treated with baths**. Of the cases in which perforation occurred, there were notes of the diet in 7; in all these semisolid food had been given previous to the perforation.

J. N. Hall and C. F. Cooper¹ analyze 529 cases of typhoid fever, about half of which were observed in private practice. Intestinal hemorrhage caused death in 15 cases and general hemorrhage in 3; perforation without hemorrhage in 7 and perforation with hemorrhage in 5. The authors think that phlebitis is more common when bath-treatment is used. **Petechial eruption** was seen in 5 patients, 3 of whom died. They think that the characteristics of typhoid fever in Colorado are much the same as at lower altitudes.

J. Skalicka² discusses **typhoid fever in Prague**, 6601 cases having occurred within 12 years in a population of about 200,000; of these, 737 died, the mortality being 11.16 %. The highest figures were found in the old and unsanitary part of the city. The disease occurred most markedly in winter, and the most striking number of cases was found between the fourth and the twentieth year of life. The better classes of persons were the least affected. There are a great many figures to indicate that **certain alleys and certain houses** in these alleys furnished an especially large number of cases.

L. Coville³ discusses the peculiarities of the **epidemic of typhoid fever at Ithaca in 1903**, noting especially the sharp onset and comparatively abrupt ending of the epidemic; the **great variety in the course** of the epidemic; the large percentage of atypic cases; the fact

¹ Jour. Am. Med. Assoc., July 11, 1903.

² Casopis lekaru cerkyh, 1903, No. 41; Zeit. f. inn. Med., 1904, p. 170.

³ Amer. Med., Jan. 9, 1904.

that many cases ran a severe and septic course, intestinal hemorrhage and pneumonia being frequent; the relatively small number of relapses in the typical cases, and the contrasting fact that a great many atypic cases showed a cyclic recurrence of symptoms at intervals of about 14 days, these being perhaps relapses or reinfections. The persons who drank exclusively of other than city water escaped infection. The milk-supply was not infected; and, through exercising great care, a summer epidemic due to flies was almost entirely prevented. Physicians and trained nurses almost completely escaped. It was noted that many who had had typhoid fever during the previous two years had another attack of the disease during this epidemic. The death-rate was only 6.6 %. Over 1300 cases—probably, indeed, over 1400—occurred. The city has now apparently become almost entirely exempt from typhoid fever. Coville mentions several classes of cases: (1) Those in which fever was absent in the beginning and remained so for from 10 days to 2 weeks, but in which relapses tended to occur about every 2 weeks, 3, 4, or 5 times. [The character of these cases is not very clearly described.] (2) Cases having a moderate temperature for a few days, followed by subnormal temperature and pulse; and also tending to relapse and sometimes showing regular typhoid temperature later. (3) Cases with short, sharp temperature, of 5 or 10 days' duration, with high pulse, followed by slow convalescence, and rarely by typical symptoms of typhoid. (4) Regular typhoid fever.

J. Cantlie,¹ discussing **typhoid fever in China**, notes that the so-called typhoid state is uncommon, and that the disease is **apparently milder** than in Great Britain, although he thinks that the actual mortality is really higher. He believes the disease to be rare among the Chinese, although reliable statistics are hard to secure. He thinks that there is strong presumptive evidence against the view that many children acquire the disease, and that this explains the immunity of a large proportion of the adults. The **method of preparing food used by the Chinese** protects them to a considerable extent from the disease, since they rarely drink water unless it is boiled, they do not drink milk, and they cook almost all their food. Cantlie notes 26 deaths out of 33 cases of the disease in Chinese. [This fact at least suggests to one that only the very grave cases among the Chinese come under observation. It is probable, therefore, that the disease is more common in China than the statistics at hand indicate. Cantlie himself considers that the immunity thought to exist among the natives is merely apparent.] The course of the disease is so uncharacteristic that, without microscopic and serum tests, the diagnosis is often extremely difficult.

A. Duncan,² in discussing **typhoid fever in India**, particularly notes some interesting figures concerning the relatively great frequency of the disease in new arrivals in that country. He discusses at some length the frequency of the disease in natives, and considers it very common among them. This, he thinks, explains many of the cases that have been called inexplicable. He insists upon the **importance of dust**—

¹ Practitioner, Jan., 1904.

² Practitioner, Jan., 1904.

sand-storms, etc.—in disseminating the disease, and mentions striking instances of the apparent importance of this factor. He also considers flies important. The course of the disease in Europeans presents certain peculiarities in India, the chart being very irregular and showing no characteristic type. The characteristic tongue is rare, and diarrhea and rash are said to be less common than elsewhere. When a fever in India is uninfluenced by a trial of quinin for a week, one should, he states, think first of hepatic abscess; next, of undulant fever; and, thirdly, of typhoid. In regard to the Widal test, the author speaks of the great frequency of the occurrence of false clumping in the tropics, and of the possibility of error through this. A virulent culture should be used, with a dilution of 1:10; and the time-limit should be made 15, or not more than 20, minutes.

F. M. Sandwith¹ discusses **typhoid fever as observed in Egypt**. He does not believe that there is any evidence that many Egyptians acquire immunity from the disease by passing through it in childhood. His postmortem experience convinces him that this is a very rare disease among Egyptian children. It is rarely seen, also, in adult native hospital-patients, although common in Europeans. The Egyptian troops, he finds, suffer less from it than do English soldiers—a remarkable fact, considering the uncleanness of the Egyptians. The comparative immunity of the rural population does not, however, extend to the dwellers in towns. European women seem to be more frequently attacked than European men. Sandwith describes one case in which a European mother had had typhoid fever when 5 months pregnant, and notes that this did not confer upon the child any protracted immunity, for the disease developed when the child was 2 years old. He emphasizes the importance of campaigning as a cause of the increase of typhoid fever in the army in Egypt. He mentions instances in which Europeans have acquired the disease in Egyptian villages in which, he believes, typhoid fever had not previously occurred among the natives. He thinks that dust is a prolific cause of the disease in Egypt, this factor being especially active through the occurrence of sand-storms and high winds. He describes instances of the persistent occurrence of typhoid fever in certain quarters, and its disappearance after these had been rendered hygienic. He finds constipation to be particularly common in Egypt and to be a very favorable condition.

L. F. McDowell,² in discussing **typhoid fever as seen in South Africa**, notes that the fever is likely to be higher than in most cases in Great Britain. He has been obliged to use antipyretics on account of the impossibility of carrying out bathing among the Dutch population. He mentions the not uncommon occurrence of **persistent vomiting** as a troublesome complication.

Complications.—E. J. Stolkund³ discusses **coincident infection with influenza** and with typhoid fever. He refers briefly to mixed infections and to the literature relating to them. He also refers to

¹ Practitioner, Jan., 1904.

² Dublin Jour. of Med. Sci., Nov., 1903.

³ Zeit. f. inn. Med., Aug. 15, 1903.

cases of mixed infection with typhoid fever and influenza, which he believes to be very rare. A few have been reported, but most authors of prominence do not mention them. He describes his own case, which occurred in a house in which there were 2 cases of typhoid fever and 2 cases of influenza. His patient's attack began with the signs of influenza, and was accompanied throughout with profuse sweats, marked pulmonary signs, and irregular temperature. The signs of typhoid fever soon developed and became characteristic. The Widal test was positive, and the sputum contained many influenza bacilli. [This subject is of much interest because of the frequency with which one sees an onset with influenza-like symptoms, oftenest during influenza epidemics, followed by definite typhoid fever. It is well worth while to determine by investigation whether influenza predisposes especially to typhoid fever.]

C. K. Russell,¹ in discussing the cases of **perforation in typhoid fever** in the Royal Victoria Hospital, refers to the fact that **pain was present in all cases**, except one in which there was marked delirium. With the exception of pain, however, there were no characteristic signs soon after the onset of the complication. There was a fall in temperature in 5 cases; and in 5, more or less localized tenderness of the abdomen, which was tense in 4 cases. Rigidity became increased in 2. Vomiting was the first symptom in 4. The symptom-complex of perforation is, in many cases, very indefinite.

J. B. Briggs,² in a note on the **blood-pressure at the time of the occurrence of perforative peritonitis** in typhoid fever, states that he has frequently seen a sharp rise in systolic pressure in patients undergoing laparotomy, apparently as the result of mechanical irritation of the peritoneum; and that Cushing suggested that the same might occur in typhoid fever at the time of perforation. Briggs found that acute general peritonitis, of whatever origin, shows, unless the patient is moribund, a state of hypertension of the pulse. A large series of typhoid patients were observed, and 2 of these showed symptoms justifying laparotomy for suspected perforation. In 1 of these 2 cases perforation was found. In this case a remarkable rise in blood-pressure had been noted at midnight. Four hours later the patient had violent symptoms of perforation; and 5 hours after this laparotomy showed the presence of 2 perforations. The condition of the peritoneum was such as to indicate that its inflammation was 8 or 10 hours old. In the second case the blood-pressure records were negative, and operation showed neither perforation nor peritonitis. Briggs thinks that **further observations along this line are important**. It will, however, be necessary to take frequent records of the blood-pressure, since rapidly rising pressure will certainly be more important than any single records, no matter how high.

F. Samohrd³ has observed 6 cases of **hemorrhagic typhoid fever**,

¹ Montreal Med. Jour., 1903, No. 8.

² Boston Med. and Surg. Jour., Sept. 24, 1903.

³ Sbornik klinicky, Bd. v, S. 22; Zeit. f. inn. Med., 1904, S. 169.

the hemorrhages having occurred in the third or the fourth week. In 3 cases these began with epistaxis, which was not controlled by treatment, but ultimately stopped spontaneously. In 3 cases there were hemorrhages into the skin. In the further course of the disease there were hemorrhages from various organs. The blood was dark, clotted poorly, and contained fewer erythrocytes and less hemoglobin than normal; the leukocytes were either normal or reduced in number. One patient died. In the latter case mixed infection was entirely absent, the cultures showing only typhoid bacilli. The condition is **not, then, necessarily a secondary infection**, but is probably an unusually virulent form of typhoid infection, causing alteration in the blood and degeneration of the walls of the vessels.

V. Legoic¹ reports a case of typhoid fever in a man of 23 years, death having occurred, at the end of the sixth week, from **profuse intestinal hemorrhage**. The colon was found to be riddled with ulcerations. Diarrhea and pain had not been present during life.

H. C. Jonas² reports a case of typhoid fever in a patient of 23 years, in which there were intestinal hemorrhage and relapse; and after this, double **phlebitis and periostitis** of the right tibia. The latter **ultimately healed after 6 relapses**. Two years after the disease had begun the patient developed **abscesses on both thighs**, which reached large dimensions and were accompanied with progressive emaciation and fever. Typhoid bacilli were obtained in pure culture from these abscesses. The blood gave the Widal reaction in a dilution of 1:10 within 30 minutes, but the reaction was very slight in a dilution of 1:20.

D. L. Edsall³ reports a series of cases of **peculiar staphylococcic infection of the skin** in a ward of typhoid-fever patients. After the occurrence of a somewhat unusual number of cases of furunculosis, some of which were quite severe, there suddenly occurred a case of the eruption under discussion; and within a short time after this several more cases of the same kind occurred. The eruption appeared on the back, the buttocks, and the posterior portion of the thighs. It first consisted of vesicles, which were usually turbid, were situated on an indurated base, and were surrounded by a bright pink zone. Most of the lesions suppurated and formed distinct furuncles. In the beginning it rather closely resembled an extensive eruption of varicella, except for the induration of the base; one case, indeed, was diagnosed varicella by a health-officer. Bacteriologic examination showed a pure culture of *Staphylococcus aureus*. The condition was evidently being **transferred from patient to patient** in the ward. Its spread was apparently controlled entirely by adopting stringent regulations concerning the disinfection of the hands of the nurses and orderlies, of the bathtub, and of the interior and exterior of the bed-pans. Edsall is inclined to believe that in these cases the infection came from the bed-pans. He insists upon the importance of having all **ward-utensils kept scrupulously cleansed and disinfected**. He refers to the danger of trans-

¹ Rev. de Med., 1903, No. 9.

² Lancet, Oct. 4, 1903.

³ U. of P. Med. Bull., Mar., 1904.

ferring infections of this sort in medical wards through using the same sponges on different patients. He thinks that **sponges should be entirely discarded** and replaced by gauze or lint, which should not be used on different patients without having meanwhile been boiled.

E. Birnbaum and H. Weber¹ describe 2 cases of typhoid fever in which the **spots became pustular** and in some places produced abscesses. Bacteriologic investigation showed the absence of typhoid bacilli in the pustules, but the presence of diplococci of doubtful nature, which were apparently secondary infections. The patients were children; Birnbaum and Weber think that the skin of children is more delicate and more subject to infection, because, with the occurrence of the eruption, the skin reacts with greater exudation.

F. Delafield² discusses the condition that he terms **posttyphoidal sepsis**. In referring to the fevers occurring after typhoid that are not continuations of the typhoidal process, he mentions ordinary moderate rises in temperature lasting a few hours, and other fevers, which are of real importance and may last for one or more weeks, but do not make the patient gravely ill and do not end fatally. In this latter class, if the patients are fed and taken out of bed, they gain steadily in flesh and in strength and the fever gradually disappears. In a third class long-continued and severe fever occurs and may terminate fatally. The general appearance, the temperature-charts, etc., in this condition are more like those of sepsis than like those of typhoid fever. These patients also usually do not get better until they have food given them and are taken out of bed. [Latent tuberculosis should be carefully sought for in these cases.]

W. R. Steiner³ reports a case of typhoid fever of severe course and with 2 relapses in which an **arterial complication** in the right upper extremity occurred on the forty-first day of the disease, there being afterward gradual recovery with complete return of pulsation in the affected vessels. The arterial trouble began with numbness and tingling in the right hand, followed by weakness and final absence of the right radial, brachial, and axillary pulses, and some swelling and redness of the skin. The arteries were red, cord-like, and tender on palpation. The hand became cold and cyanotic. There was a gradual clearing-up of the condition. A return of pulsation was noted in the right radial and brachial arteries 35 days after its onset. The pulse in the axillary had returned rapidly.

K. A. Krause and C. Hartog⁴ report a case of **posttyphoidal thyroiditis** that occurred in a man of 23 years. He had had a goiter for years, and during his convalescence developed an acute swelling of the thyroid which advanced to the production of a marked feeling of constriction and pronounced dyspnea. Fluctuation also developed. Incision showed pus, in which the typhoid bacillus in pure culture was present. A noteworthy fact is that the temperature was falling at the time and was not influenced by the abscess. In the bacteriologic remarks Hartog emphasizes the importance of **serum-plates**.

¹ Deut. med. Woch., 1903, No. 46.

² Med. Rec., Sept.

³ Am. Jour. Med. Sci., Feb., 1904.

⁴ Berl. klin. W.

rapid isolation and identification of typhoid bacilli, and states that he has had excellent results from the use of Löffler's medium to demonstrate the presence of typhoid bacilli.

C. Bolton¹ reports an interesting case of typhoid fever in a nurse 24 years of age. There was an ordinary severe course up to the ninth day, when a chill occurred. Subsequently to this there were **20 other chills**; and later on, many exacerbations of fever without chill. There were persistent and very dangerous hemorrhage and diarrhea. In discussing the cause of these rigors due to obscure conditions Bolton particularly notes that the **cause in this case repeatedly appeared to be diarrhea**. In many instances the patient had an imperative desire to go to stool, and the bowels moved in bed before attention could be paid to her. This was associated with a chill. Sometimes the stool was passed unconsciously, and attention was directed to it only by the occurrence of rigor, although the chills also occurred after the diarrhea had been checked. Bolton thinks that the evidence shows the chills in such cases to have been **due to irritation of the mucous membrane**. He believes this to be a common cause of these chills. [We have observed a similar association between evidences of intestinal irritation and chills. This may be one of the causes, but we have seen cases in which there was absolutely no evidence of especial disturbance of the digestive tract or of any other condition to which the chills could rationally be referred.]

H. A. Black,² in discussing the **nervous complications of typhoid fever**, reports a case in which, he thinks, meningitis was present; and also 2 cases in which he considers typhoid to have been the primary condition, in one of which hemiplegia occurred, and in the other, paralysis of the laryngeal nerves. These 2 cases were fatal.

J. M. Burlew³ reports a case in a man of 59 years in which there had been biliary colic followed by jaundice. Upon admission there was extensive tuberculosis. The man died; necropsy showed widespread tuberculosis, with cholelithiasis, suppurative cholecystitis, cirrhosis of the liver, and other changes. A point of interest is the fact that from the gallbladder and heart's blood there were isolated organisms showing all the characteristics of typhoid bacilli. There was no history of previous typhoid fever. Burlew has found 6 other cases in which there was **cholelithiasis** associated with the presence of *Bacillus typhosus*, **without any history of a previous attack of typhoid fever**. He has also collected 14 cases in which cholelithiasis and cholecystitis occurred during or after typhoid fever, the typhoid bacillus having been isolated in pure culture from the contents of the gallbladder; and 10 cases of cholecystitis accompanying or following typhoid fever in which *Bacillus typhosus* was isolated in pure culture from the contents of the gallbladder.

Diagnosis.—W. Krauss,⁴ in discussing southern infections, emphasizes the fact that the term "congestion," so often used, is commonly a misnomer for sunstroke; and that in cases of this sort it is important

¹ Practitioner, Jan., 1904.

² Medicine, Oct., 1903.

³ Amer. Med., Apr. 9, 1904.

⁴ Jour. Am. Med. Assoc., July 11, 1903.

to avoid giving quinin without due cause. The malarial leukocyte-count is only collateral evidence of malarial infection, and is of value only when all the cells in the spread are counted. Chill and fulminant onset may occur in typhoid fever complicating malaria, but the same results may be observed in the convalescents from uncomplicated typhoid fevers. In malarial infection the temperature is not infrequently irregular, and perhaps almost or quite continuous for a time after thorough cinchonization; yet typhoid fever is absent, and plasmodia are not to be found. Krauss believes that the fevers met with in the summer and fall are usually typhoid or malaria, although some cases are neither; but he **does not believe in the existence of a common fever that is neither typhoid nor malaria.**

T. J. Happel¹ discusses what he terms "**continued fever,**" which he believes to be neither malaria nor typhoid, describing the characteristics of many cases that he has observed in Tennessee. [The descriptions given tend to convince one that the disease is usually typhoid fever.]

L. Hektoen² reports a case of **combined scarlet fever and typhoid fever,** with particular reference to the fact that blood-cultures in this case demonstrated positively the presence of typhoid fever. He refers to the **importance of blood-cultures** in the early demonstration of the nature of peculiar cases of typhoid fever complicated by a resemblance to other conditions.

L. Kast and C. Gütig³ have made a somewhat extensive study of **hypoleukocytosis** in its relation to typhoid fever and other conditions. They insist that it is **one of the most important signs of typhoid fever,** counts of 12,000 or over in the early stages making the presence of that disease extremely improbable. Among the other points they note that relatively high counts of the white cells observed for a long time probably indicate a favorable prognosis. A sudden increase in the number of lymphocytes is an ominous sign, as is the occurrence of a more marked leukopenia toward the end of the disease, as the latter often indicates a complication.

H. A. Higley⁴ discusses the **differential leukocyte-count** in the early days of typhoid fever, and insists that the observations that he has so far made have indicated that in many instances the leukocyte-count that is somewhat characteristic of typhoid fever **may be observed during the first week** of the disease. He believes that the observations of Thayer and others are of somewhat doubtful value, in that the period of the disease in which they were made was not, in many instances, definitely determined. Upon this fact depends the difference in Higley's results. He has studied 16 cases and reports them. He concludes that the characteristic differential count is seen within the first week of the disease. He says that its definite value in diagnosis is, as yet, unknown, but that the differential count is of more value than the mere total count alone.

¹ Jour. Am. Med. Assoc., July 11, 1903.

² Med. News, Sept. 26, 1903.

³ Deut. Arch. f. klin. Med., Bd. lxxx, Hefte 1 u. 2.

⁴ Med. Rec., Sept. 19, 1903.

R. Stern¹ contributes a very interesting discussion of the **value of the agglutination-test** in the diagnosis of typhoid fever. The general conclusions that he reaches are that the term "positive reaction" varies greatly with different workers; and that even if the same degree of dilution is used, the other details of the test may make decided **differences in the results of various workers**. Agglutination is a much more complicated process than it was at first thought to be. For clinical purposes its value is much reduced on account of the varying readiness with which different cultures agglutinate, and also on account of the antiagglutinating action of various serums. Stern does not think that a positive reaction at 1 : 50 can any longer be considered a certain indication of infection with the typhoid bacillus, for it has been abundantly shown that other infections may produce as marked a reaction as this. These infections are not only with bacteria of the same group, but also with related bacteria; and Stern has even shown that proteus and staphylococcus infection may produce a high grade of agglutination of the typhoid bacillus. It is **difficult to distinguish this indirect agglutination** from the direct agglutination produced by the typhoid bacillus itself. As a rule, infection with one organism produces a much more marked reaction against that organism than against others; but this is not always the case. Serum-diagnosis, therefore, can, at best, indicate merely the probability of some special infection. It is of no value unless carried out quantitatively, and, best, repeatedly, during the course of the disease. It should be recognized that an **agglutination-reaction is only a symptom** and is not superior in value to all other symptoms.

Langstein and Meerwein² discuss the occurrence of the **Widal reaction in icterus**, and report the case of a woman of 22 years whose serum caused a marked Widal reaction, and who was demonstrated by operation to have cholangitis resulting from cholelithiasis. The reaction was positive at the time when there was absolute retention of bile. When, however, with persistent icterus, some bile began to reach the intestinal contents, the blood-serum lost its agglutinative action. From this and other cases, therefore, the authors decide that the Widal reaction occurs in icterus **only when the biliary retention is absolute**. This is analogous to the observation of Köhler, who found that the injection of taurocholic acid into the blood-stream, with the coincident ligation of the choledoch duct, caused the blood-serum of animals to become markedly agglutinative. The observations made are not yet, however, sufficient to indicate that this reaction in icterus means absolute retention of bile; and a further study of the conditions in various forms of hepatic diseases should be made in order to determine this point definitely.

R. Stern and W. Körte³ have devised a new **typhoid reaction**. This consists in taking fresh normal serum, adding typhoid bacilli, and then decreasing amounts of the serum that is to be tested, this serum

¹ Berl. klin. Woch., July 27 and Aug. 3, 1903.

² Wien. klin. Woch., 1903, No. 27.

³ Berl. klin. Woch., Feb. 29, 1904.

having been inactivated by heating to 56° C. They determine at what dilution the serum to be tested still shows bactericidal action. One can either pour plates or let tubes stand for some hours in the thermostat, and determine the result by observing the occurrence or the absence of a clouding. They have studied the serums of 32 typhoid-fever patients, and find that in all the cases the reaction occurred in dilutions as great as 1 : 1000. In most of the cases it occurred in dilutions of 1 : 50,000; and repeatedly in dilutions of over 1 : 1,000,000. The bactericidal action was observed in much more marked dilution than was the agglutinative reaction; and they think that in cases in which agglutination is negative or doubtful their method may prove to have clinical value.

Kirsch¹ has investigated the value of **Cambier's method** of isolating typhoid bacilli. Cambier thought that the rapidity with which motile bacilli pass through a porcelain filter with pores of considerable size might be used as a method of distinguishing between typhoid and colon bacilli. Kirsch's investigations of this method lead him to the conclusion that it is not satisfactory for demonstrating the presence of typhoid bacilli in the dejections from a typhoidal case, and that it has **little or no clinical value**.

Treatment.—R. I. Cole² contributes an interesting and valuable discussion of the **prevention of typhoid fever**, giving details as to the means to be used in disinfecting the excreta, and insisting emphatically upon the responsibility of the physician in charge of the individual cases in preventing the spread of the disease beyond those patients.

R. M. Harbin,³ in a study of 90 cases of typhoid fever, states that he believes that **preliminary fasting and a restricted diet** are indicated in this disease; that emaciation occurs independently of the amount of food taken; that fasting should be carried out in severe cases for from 24 to 48 hours; and that after this there should be a limited amount of baths, dilute milk, etc. He thinks that the bath is more effective during a fast. He considers fasting particularly important in the presence of diarrhea and vomiting. His mortality in this series of cases was 4.4 %. [A brief fast is useful if digestion is upset. We have, however, almost certainly seen typhoid cases killed by prolonged severe restriction of food.]

J. W. Moore,⁴ in a general discussion of the treatment of typhoid fever, particularly notes an instance in which **rapid improvement followed mere removal from an unhealthful dwelling** to a clean and well-ventilated ward. He insists that troublesome **diarrhea is frequently started by the routine use of purgatives** at the beginning of the fever. He deprecates the employment of antipyretics. He especially warns one against the routine treatment of the disease, particularly in the matter of alcoholic stimulants.

T. McCrae,⁵ in discussing the methods of treating typhoid fever in the Johns Hopkins Hospital, emphasizes the **importance of giving**

¹ Deut. med. Woch., Oct. 8, 1903. ² Jour. Am. Med. Assoc., May 28, 1904.

³ Jour. Am. Med. Assoc., July 11, 1903.

⁴ Practitioner, Jan., 1904.

⁵ Practitioner, Jan., 1904.

an abundance of water. He states that it is customary in that institution to give a minimum of 3 liters of fluid a day.

C. C. Bass¹ recommends the routine treatment of typhoid fever with castor oil, the doses being so regulated as to produce one or two bowel movements. [The general opinion of clinicians of wide experience now is opposed to the routine administration of purgatives, even in the beginning of typhoid fever, and certainly in the course of the disease. Furthermore, the routine use of any drug in any disease is nearly always a harmful custom.]

A. T. Livingston² recommends the use of **ergot in typhoid fever** as a routine method of treatment.

M. Einhorn³ presents the records of a series of cases that he has treated with **Jez's antityphoid serum**. He did not find that the course of the disease was materially shortened. He observed that there was likely to be a reduction in the fever and often an improvement in the general condition after the first or the second injection. He believes that injections should be carried out early in the disease, even when there is only a suspicion of typhoid fever; and that the serum-treatment has already been of decided value. [These results, as well as those of other observers, and the nature of the serum do not encourage us to use it.]

D. G. Marshall⁴ reports a case of **grave typhoid fever** in which profuse hemorrhage occurred and there was profound collapse. The patient was repeatedly treated with normal saline hypodermoclysis, with favorable results. The author describes his **simple household apparatus**, which is made of a Southey's trocar; a piece of rubber-tubing; and an ordinary two-ounce glass male syringe from which the piston has been removed, the fluid being poured into this by an assistant. The syringe is held within the hand, in order to keep it warm.

PARATYPHOID FEVER.

G. B. Smith⁵ reports a case of paratyphoid fever, the bacillus isolated from which showed no important points of difference from other paratyphoid bacilli in its morphology, but developed a **strong acid reaction in litmus-milk**. It did not coagulate the milk, however, and the reaction changed very slowly to alkaline. No change in the color of neutral red agar occurred, and there was an **absence of fermentation, except in glucose mediums**, this being an especially noteworthy departure from the common type of paratyphoid organisms. The author also mentions his findings in a second case, in which the isolated bacillus had the general characteristics of a paracolon bacillus. The latter case is described briefly by J. W. Walker.⁶ The patient, a man, presented **extremely irregular temperature and had marked chills and sweats**; there were also a relapse

¹ N. Y. Med. Jour., Dec. 26, 1903.

² Med. Rec., Jan. 16, 1904.

³ Jour. Am. Med. Assoc., Dec. 12, 1903.

⁴ N. Y. Med. Jour., Apr. 16, 1904.

⁵ Lancet, Oct. 28, 1903.

⁶ Ibid.

and a femoral thrombosis. He ultimately recovered entirely. He gave no typhoid Widal reaction. He had no determinable enlargement of the spleen; no spots; and no abdominal symptoms of any sort. There was no cough, but the symptoms were such as to suggest chiefly acute miliary tuberculosis or malarial fever.

Gütig,¹ after a study of the blood in 6 cases of paratyphoid, concludes that it exhibits **conditions practically identical with those in typhoid fever**. He has found hypoleukocytosis, relative increase of the lymphocytes, and disappearance of the eosinophiles. He says that in abortive cases of typhoid characteristic blood-changes are, as a rule, absent.

W. Bauermeister² reports the case of a man of 35 years, running a course similar to that of typhoid fever. The patient later had an abscess of the testicle. The cause of the fever and of the suppuration in the testicle had apparently been *Bacterium coli commune*, which was cultivated from the abscess. The fever had been extremely persistent. It cleared up, however, after the abscess had developed and had been opened; and Bauermeister believes that this focus in the testicle was probably the **source of the prolonged course of the fever**.

TUBERCULOSIS.

Etiology and Pathology.—E. von Behring,³ in an address upon **Tuberculosis, its Origin and Control**, goes briefly over his previously reported work. He speaks very favorably of Jousset's inoscopy for examining exudates for tubercle bacilli. This consists in allowing fibrin-masses to form, this fibrin fixing the bacilli; the fibrin is then dissolved in a mixture of 1 or 2 parts each of glycerin and of 22 % hydrochloric acid, 3 parts of sodium fluorid, and 1000 parts of distilled water; after digestion has been completed the fluid is centrifugated; and the bacilli may be found in the sediment. The author insists strongly upon his view that in a large proportion of cases tuberculosis arises very early in life. Mere opportunity for infection with tubercle bacilli, he thinks, is far from being the chief factor in causing the disease. The **most important factor is predisposition**; and this predisposition is present particularly in the very young. He believes that familial tuberculosis has an evil prognosis. The milk taken by infants, he insists, is the **chief source of tuberculous infection**, the power of protecting itself against infection through the digestive mucous membrane being absent in the infant, though present in the adult. He mentions that he has determined that genuine albuminous bodies **pass through the mucous membranes of newborn animals unchanged**, and cause the same biologic reactions as when injected beneath the skin. He has also determined that this is the case with certain bacteria, virulent anthrax bacilli having caused general infection when ingested by very young animals, while this did not occur with older animals; attenuated

¹ Prag. med. Woch., 1903, No. 20.

² Zeit. f. klin. Med., Bd. lili, Riegel Festschrift.

³ Deut. med. Woch., Sept. 24, 1903.

anthrax bacilli, also, were found in the circulation of newborn guinea-pigs after having been ingested; this, likewise, not having been the case with older guinea-pigs. This was also shown to be true of tubercle bacilli, newborn animals having been made tuberculous by administering tubercle bacilli by the mouth, and the intestinal mucous membrane having shown no alterations. Von Behring especially notes that, clinically, these animals first showed tuberculosis of the cervical glands, and later often developed the appearance usually considered to be characteristic of inhalation-tuberculosis in guinea-pigs. He insists that these observations demonstrate the **extreme importance of primary intestinal infection**, especially in early life. Milk, he says, is undoubtedly one of the main sources of infection. Human milk can rarely be the cause of this infection, but cows' milk may readily be so. The author strongly recommends pasteurizing cows' milk at once at the place of its production. He states that he has found that newborn animals do not show a complete epithelial covering of their mucous membranes; this largely explains the readiness with which these animals may be infected through their digestive tracts. This infection, he believes, **remains, in many instances, latent for months or years**; it then develops into what is recognized clinically as tuberculosis. He also insists that adults should be particularly protected against any possibility of tuberculous invasion when they exhibit an acute or a chronic disturbance of digestion, as they are then likely to become infected through their digestive tracts. He is convinced of the **importance of bovine tuberculosis in causing the human disease**. He then reviews his work upon the immunization of animals, and refers with extreme hopefulness to his previously expressed opinion that **immune substances may be given to human subjects** in the milk of cows that have received immunizing injections by his method. He also thinks that at some time it will be possible to immunize human beings by vaccination, by some modification of his present method of treating cattle—perhaps by giving the material to infants through the digestive tract.

E. von Behring¹ again discusses the genesis of phthisis and the control of tuberculosis, and adds some new facts. He criticizes Mitulescu's work on the presence of tubercle bacilli in circulating-library books, admitting the correctness of that author's observations, but not admitting that there is any testimony to show that such books actually do spread tuberculosis. Von Behring again insists that the hypothesis that tubercle bacilli primarily enter through the air-passages is unproved. He discusses predisposition to tuberculosis, and decides that the chief point in predisposition is opportunity for infection. He believes that most persons presenting the phthisical habitus are not merely predisposed to phthisis, but actually have tuberculous infection which they have carried about with them for a long time. In discussing inhalation-infection and other methods he states that by **injecting tubercle bacilli into the parenchyma of the tongue** in guinea-pigs one may produce

¹ Deut. med. Woch., Feb. 4, 1904.

in them the lesions of "inhalation-tuberculosis." This procedure, through involving the glands beneath the jaw, the lower cervical glands, and finally the mediastinal glands, infects the lungs and the blood-current, while ordinary methods of infecting guineapigs cause death within a short time and do not permit of the development of the signs of ordinary human pulmonary consumption. Baumgarten has shown that a special method may produce this in guineapigs; and von Behring states that, with Römer, he has shown that when **milk from cows with tuberculosis** of the udder is **treated with formalin** and injected into guineapigs, it **produces a very chronic form of tuberculosis**. These animals gradually emaciate and present the signs of ordinary pulmonary consumption during life; after death even large cavities may be present in a limited portion of the lung, while the remaining portion is uninvolved. This may proceed for months before causing death; and in goats the author has seen the disease last for two or three years. He insists again that human "consumption" is the **end-stage of an infection acquired in infancy**. He discusses the administration of immune-bodies in the milk, and states that the most successful method of preserving the milk without destroying these immune-bodies is to add a small amount of formalin. He likewise discusses the bactericidal action of milk, which he believes he has demonstrated to be very energetic in regard to colon bacilli and thinks also to be active in regard to tubercle bacilli. He believes that he has demonstrated that this bactericidal power is directly connected with the colloidal remnants of the protoplasm of the glandular endothelium. [Many of von Behring's statements are startling; others are in direct opposition to the results of other investigators. His conclusions must be received with reserve.]

C. Weigert,¹ in referring to von Behring's view that sucklings, both human and animal, have not the same power of preventing bacteria from passing the walls of their digestive tract that adults possess, refers to a paper of his own, in which he expressed a similar view. This paper was published 20 years ago, but the public has not had free access to it. It refers especially to the fact that adults exhibit tuberculous disease of the lymph-vessels near the intestine; while the lymph-glands near by are little, if at all, affected. The contrary is true of children, who often show advanced tuberculosis in their lymph-glands; while the lymph-vessels leading from the intestines to these glands show no disease. The converse conditions may be found in the two periods of life, but the first statement is the one that is usually found to be true. Weigert, therefore, concludes that the poison of **tuberculosis reaches the intestinal lymph-vessels of children much more rapidly** than it does those of adults. It is also much more rapidly absorbed, and is quickly carried to the glands; while in adults it is chiefly a process of advancement by contiguity. This he considers to be also true in the bronchi, the lungs, the mouth, and the external integument. He particularly insists that **disease of the lungs in children is often secondary** to disease of the bronchial and pulmonary glands.

¹ Deut. med. Woch., Oct. 8, 1903.

F. Weleminsky¹ has made a study of the method of infection in tuberculosis, using guineapigs and rabbits, and administering tubercle bacilli through the digestive tract. He found somewhat varying results in the different animals. Some of the rabbits remained entirely well; 1 showed disease of the intestine and of the respiratory tract; 3 showed tuberculosis of only the respiratory tract, without any involvement of the intestine. The guineapigs all showed tuberculosis of the intestine and of the respiratory tract; but the author believes that the **disease of the respiratory tract was secondary** to disease in the submaxillary glands, which showed advanced lesions. From his results he decides that the **ingestion of tubercle bacilli may produce** not only disease of the intestine, but also **disease of the respiratory tract**. When the respiratory tract is infected, the infection is carried down through the submaxillary and cervical glands to the bronchial glands; and from the bronchial glands, he thinks, it is carried by the circulation to the most susceptible organ, the lung.

A. Macfadyean and A. MacConkey² report a series of **examinations of mesenteric glands**, tonsils, and adenoids with reference to the presence of virulent tubercle bacilli. Their method of procedure consisted in the use of a mechanical contrivance devised by Rowland. This, they thought, would facilitate the detection of the bacilli, particularly when but few were present. They made subcutaneous and intraperitoneal injections into guineapigs, and also looked for the bacilli in smears. There were 28 cases in which they looked for tubercle bacilli in the mesenteric glands. All but 2 of the persons from whom these glands were obtained postmortem were under 5 years of age. No mention was made in any of the pathologic reports of these cases of the presence of intestinal lesions. Of the patients, 8 had tuberculosis; the other 20 had other diseases. Virulent tubercle bacilli were found in 10 cases; the experiments were negative in 18. Of the 8 cases of tuberculosis, 5 were positive and 3 negative. It is a striking fact that **5 persons supposed at postmortem to have been nontuberculous had virulent tubercle bacilli in their mesenteric glands—i. e., 25 % of the nontuberculous persons**. Microscopic examination was negative in 7 instances in which the animal experiment was positive. One of the positive cases was in a stillborn child. The condition of this child's mother is not mentioned. The authors also examined a series of 44 adenoids and 34 tonsils. Since these tissues were diseased, it would appear probable that their resistance to the invasion of tubercle bacilli must have been lowered. The results in all instances, however, were entirely negative.

A. Macfadyean³ reports a series of experiments undertaken to determine the **relative infective properties**, in monkeys, **of the human and the bovine strains** of tubercle bacilli. In 15 experiments upon monkeys—with, in one series, human, and in another, bovine, tubercle bacilli or tuberculous tissues—it was found that, in the first place, ⁴ animals died in from 2 to 10 days after having been fed

¹ Berl. klin. Woch., Sept. 14, 1903.

² Brit. Med. Jour., July 18 1903.

³ *Lancet*

bovine tuberculous material. Normal human sputum did not produce this effect, and the result suggests that it might have been due to auto-intoxication. The monkey proved to be equally susceptible to the human and the bovine strain of the bacillus, the most striking difference in their effects being exhibited in the digestive tract. Intestinal lesions were found in the case of every monkey fed with human tuberculous material, while none of the monkeys fed with bovine material showed any tuberculous ulcers in the intestines. Macfadyen thinks, therefore, that **virulent tubercle bacilli may pass through the intestinal wall** in large numbers without producing any detectible lesion of the intestine itself. Food-tuberculosis can **apparently be as readily produced by the bovine tubercle bacillus as by the human form.**

Flügge¹ discusses von Behring's recent articles and criticizes them very unfavorably. He thinks, particularly, that the addition of formalin to milk is probably associated with danger, and that von Behring has not good ground for his statement that raw milk contains any substance protective to human subjects, or that tuberculous infection generally takes place in early life. Flügge believes that **infection is usually due to contact with other cases of phthisis.** While he admits the importance of bovine tuberculosis, he considers it of much more limited consequence than does von Behring. [The last sentence gives a fair statement of the matter. Bovine tuberculosis is now quite generally recognized to be of direct importance in the production of human tuberculosis; human subjects of the disease are of far greater importance. Most of the opponents of Koch have not claimed more; they have only demanded that protection be offered against the danger that actually lies in bovine tuberculosis.]

Flügge² also discusses the **ubiquity of the tubercle bacillus** and the predisposition to phthisis. He energetically criticizes the present general tendency to consider the danger of acquiring tuberculosis to be ubiquitous. He insists that the **danger is dependent upon contact** with tuberculous cases or living in neighborhoods in which sputum is more or less freely expectorated. He reviews the literature to demonstrate that while tubercle bacilli may be found by chance in dust and dirt from almost any region, this occurs only occasionally, except in regions more or less closely connected with those suffering with tuberculosis. He criticizes von Behring's statements, particularly concerning the infantile origin of tuberculosis; although he believes that tuberculous cattle and their products do sometimes cause infection. He admits that the possibility of acquiring tuberculosis is widespread, but thinks to call it ubiquitous is to take away at once most of our power of controlling the disease. He also insists that **too much has been said concerning the individual predisposition** to tuberculosis, and leans toward the view that even moderately unhygienic conditions of life have nothing to do with the dissemination of the disease. In discussing its control

he fact that it is not so much the character of dwelling
as the fact that one is dwelling in the house with

¹ b. 18, 1904.

² Deut. med. Woch., Jan. 28, 1904.

tuberculous persons, that is dangerous. The disease may be transmitted even in the open air.

E. Schwarzkopf¹ has made a study of the **importance of exposure to infection, of heredity, and of predisposition** in the development of tuberculosis of the lungs. He insists that most of the observations already made upon this point are faulty in that they have not been **comparisons of phthisical persons with nonphthisical** when both groups have been studied in the same way. The control observations on nonphthisical persons have been largely collected in a haphazard fashion. The author has made a study of 354 women, having selected persons of this sex because in them the social factors are such as to make the special points that he wished to investigate clearer. He compares the conditions in those that were phthisical and in those that were not phthisical, and finds that with manifest tuberculosis of the lung **opportunity for infection has been present in 61.25 %** of the cases; while in those that were not phthisical there had been recognizable opportunity for infection in only 24.22 %. When the opportunity for infection is relatively slight, such as that to which almost any one may be subjected, repeated infection is necessary, in the author's opinion, in order to produce tuberculosis. The **danger of acquiring the disease increases with the number of phthisical persons in the neighborhood and with the prolongation of the exposure to infection.** Infection acquired in childhood produces, in Schwarzkopf's opinion, with only relative rarity, a manifest tuberculosis showing its first signs after the thirteenth year of life. When repeated opportunities for infection have occurred, children of this age show tuberculosis more frequently. The **period of particular danger** seems, from his statistics, to be between the fourteenth and the fortieth year, the danger increasing somewhat up to the end of this period. The menace of phthisical persons to those in their neighborhood seems to disappear when the subjects of the disease use the necessary rational measures in regard to coughing and expectoration. Mere hereditary predisposition to the disease does not, Schwarzkopf thinks, judging from his statistics, have the slightest influence upon the development of a manifest tuberculosis of the lung. In such cases **there has always been exposure to infection.** The latter is the actual cause of the development of the disease. Child-bearing and lactation seem to have an unquestionable influence upon the development of tuberculosis, and also to have an unfavorable effect upon the course of the disease.

A. Newsholme² insists upon the **extreme importance of direct exposure to the tubercle bacillus** in the propagation of tuberculosis. He mentions an instance in which a woman had tuberculosis; her child died of tuberculous meningitis; one sister who had aided in nursing her acquired a condition that was probably tuberculous; and 3 servants who worked in the house developed tuberculosis. He considers it **ir** for health-boards to provide **means for practitioners to hav**

¹ Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 1 u. 2.

² Lancet, Jan. 30, 1904.

examined free of charge; and he believes that measures should be taken to **control tuberculous persons**, particularly those who have tubercle bacilli in their sputum, and prevent their infecting the community. In Brighton, in spite of the fact that notification has been carried out in a considerable number of cases of phthisis in recent years, there has been no appreciable friction caused by the visits of the health-authorities, and much good has been accomplished.

Kölzer¹ has studied the expired air in 15 cases of phthisis, exposing Petri dishes containing sterile gelatin or physiologic salt-solution. From these dishes he injected 30 guineapigs, and in one case produced tuberculosis. He believes that this indicates that **tubercle bacilli are contained in the expired air**. The fact, also, that moisture is being constantly stirred up in the lungs by the respiratory movements would lead one to expect the presence of minute particles of fluid in the expired air; and these may contain tubercle bacilli. The author thinks, however, that the expired air is of little practical importance in the dissemination of the disease.

J. Orth² discusses the general question of the **intercommunicability of human and bovine tuberculosis**, taking the very positive stand that it has been demonstrated that it may occur in either direction. He reports some further observations of his own, in which calves were injected with tuberculous masses coming from human sources. Two of these animals developed widespread tuberculosis. The utmost care was adopted in these experiments to exclude the possibility of previous tuberculosis or of infection through the stall or other means; and the author considers that they absolutely demonstrate that human tuberculosis may be transmitted to animals. He uses the argument [which has been advanced by Ravenel] that if these were human bacilli, human beings can infect animals; and that if they were bovine, bovine bacilli can cause disease in human beings, for they were obtained from human subjects who had severe and extensive tuberculosis. He states that inoculations do not provide a method of differentiating between human and bovine tubercle bacilli. There is **still doubt as to the frequency** with which tuberculosis may be transferred from animal to man, or vice versa; but there is none that it may be so transferred.

J. Orth,³ in some further discussions on tuberculosis and its origin, mentions the observations that he and his assistants have made during the first fifteen months that he was on service in Berlin. In this time there were 287 children in the first year of life. In 10 of these—*i. e.*, 3.4 %—tuberculous changes were found. Of children below 15 years of age there were 131, of whom 37 had tuberculosis; 2 only—*i. e.*, 1.5 % of all the children that came to autopsy, and 5.4 % of the tuberculous—showed primary tuberculosis of the digestive tract. Orth criticizes sharply the observations of Heller. He also particularly refers to the fact that **inhalation-tuberculosis may affect primarily the**

Mar. 14, 21, and 28, 1904.

ly 20, 1903.

Infektionsk., Bd. xlv, Heft 2.

digestive tract, a fact that is commonly lost sight of; hence, primary tuberculosis of the digestive tract by no means necessarily indicates food-infection. He believes that the **chief danger is from the excretions of human subjects** that have the disease.

A. Heller¹ replies, discussing the method of infection in tuberculosis, particularly in relation to Orth's criticisms. He refers to the observations made under his own direction by Wagener and Hof; the former, of the 600 necropsies made in 1903; the latter, of 1500 postmortem protocols made during the period of Heller's service at Kiel. In the former there were 76 children, from 1 to 15 years old, with tuberculosis; and 21.1 % of these had, he believes, primary disease of the intestine or of the mesenteric glands. Hof's observations showed 16.6 % of primary tuberculosis of the digestive apparatus without involvement of the lungs; and 8.5 % in which miliary tuberculosis of the lungs followed upon the disease of the digestive tract. Furthermore, in 1904, so far as his observations have gone, there have been about 26 % of **primary intestinal tuberculosis** in the autopsies on tuberculous children. In many of these cases the children were from excellent families, in which there was no reason for especially considering infection through eating infected dust, etc., from the floor. Heller believes that the reason intestinal tuberculosis was so common in his observations is that **in this region a great deal of unheated milk is consumed**; while in Berlin, for example, and in many other regions in Germany, practically all the milk used is heated. He thinks that this satisfactorily explains all the points that Orth has criticized. [We are inclined to believe that the truth lies somewhere between the beliefs of Heller and Orth.]

J. O. Symes and T. Fisher,² in some observations concerning the **primary seat of infection** in 500 patients dying of tuberculosis, states that of 102 under 12 years of age, the primary infection was **definitely abdominal in 11.7 %** and **definitely thoracic in 55.8 %**; while **in 23.5 % it was doubtful** whether it was abdominal or thoracic. In the other cases the infection probably occurred elsewhere. The ratio of primary abdominal to primary thoracic tuberculosis in the series below 12 years of age was 1 : 4.7. It was slightly greater during the next decade; while after 25 years it decreased to 1 : 9.66. It remained practically the same in the next decade, the abdominal cases disappearing after that age.

N. Raw,³ in discussing human and bovine tuberculosis, states that among 2000 cases of tuberculosis of the lungs he has seen affection of the glands and joints in but 6 instances. On the other hand, he notes the rarity of pulmonary phthisis in children under the age of 12 years, and the **frequency of intestinal and mesenteric tuberculosis in children**. He thinks that the latter conditions are **probably bovine tuberculosis conveyed by milk**, and that they are not related to ordinary human tuberculosis. [The last part of this conclusion is certainly not well supported by evidence.] He mentions the frequency of cases of **tabes mesenterica** confirmed by necropsy under his observation, noting

¹ Berl. klin. Woch., May 16, 1904.

² Brit. Med. Jour., Apr. 16, 1904.

³ Liverpool Medico-Chir. Jour., Jan., 1904.

38 such cases within the last 5 years, 23 of which occurred in children less than a year old.

C. Grouvan¹ has made a study of the material from the skin-clinic and the polyclinic at Bonn, throughout a period of 7 years, including altogether 1130 cases, in order to determine the **relation of lupus and scrofuloderma to tuberculosis situated elsewhere** than in the skin. He finds that there is either a family tendency to the disease or tuberculosis elsewhere in **80.32 % of all cases** of lupus and scrofuloderma. This fact he believes to constitute a strong evidence of the identity of lupus and tuberculosis. All the cases of lupus in the clinic at Bonn that came to autopsy showed tuberculosis of other organs, so that, with advanced lupus, it is uncommon to find the disease confined entirely to the skin.

S. Harris,² in some observations concerning **tuberculosis in the negro**, refers to the United States Census Reports for 1900, which show, in the registration-area, 126.5 deaths of consumption in 100,000 of population among whites, while there were 485 deaths of that disease in an equal number of negroes. He also discusses other figures, and states that an important method of conveying the disease is undoubtedly **the filthy custom of spitting** on the floors of houses and churches—particularly the latter. He thinks that **tuberculous peritonitis is much more common** in the negro than in the white, and finds acute pneumonic tuberculosis to be very common among negroes.

G. G. Sears³ has made an attempt to **trace 439 cases of pleurisy** treated in the Boston City Hospital between 1880 and 1895. Within 17 years 86 patients are known to have died, and 23 others are thought to have died; 45 certainly died of phthisis; 13 others probably died of phthisis; and a large number of others died of diseases of the respiratory tract or of disease that might readily have been tuberculous. Including the doubtful cases, 74 % died of disorders that either were tuberculous or might readily be thought to have been tuberculous. Over 39 % of those that died did so within 2 years; and over 70 % within 5 years. When it occurred, tuberculosis developed within 5 years in over 70 %. **Over 55 % of all the patients** followed to their death **died of some form of tuberculosis**. [Careful investigations still bring out more clearly the great frequency with which pleurisy is tuberculous.]

J. M. Anders⁴ has made a study of the **relation between typhoid fever and acute tuberculosis**, as shown by the postmortem-records at the Philadelphia Hospital and the Episcopal Hospital of Philadelphia. He also includes some records from the Johns Hopkins Hospital. He gives, in all, a total of 249 cases, of which 23 showed both tuberculous and typhoid lesions, 19 of these being chronic tuberculosis and 4 acute. Two of the latter were acute pneumonic phthisis; and the other two,

¹ Brauer's Beitr. z. Klinik d. Tuberk., 1903, p. 159.

² Jour. Am. Med. Assoc., Oct. 3, 1903.

³ Bost. M. and S. Jour., Feb. 25, 1904.

⁴ Am. Jour. Med. Sci., May, 1904.

miliary tuberculosis. He decides that **typhoid infection in acute tuberculosis is rare**, but refers to the frequency with which the two conditions are confused with each other.

G. Scagliosi¹ reports a case of **isolated tuberculosis of the pericardium** that occurred in a woman of 60. The patient died of pyelonephritis, and the tuberculosis of the pericardium was accidentally found after death. So far as could be determined by an extensive study of the other tissues there was no tuberculosis elsewhere. The case resembled the majority in that it occurred in an elderly person.

Symptomatology.—E. L. Jones² discusses a series of observations he has made concerning the **variations in the physical signs** in the upper chest-regions, particularly in healthy persons. He especially notes that the **right clavicle is tilted more than the left** in right-handed persons, and that the contrary is true in those who are left-handed. If this is not found to be the case in any individual under observation, this fact should cause a suspicion of disease of the apex. The author also discusses the differences that are commonly mentioned in fremitus and percussion at the right apex as compared with the left, and especially notes the condition of the thoracic walls. He mentions a case in which there was less resonance on the right, which was found to be due to a **thickening of the subcutaneous tissues**, as the result of a former venous thrombosis. He discusses the **determination of the height of the apexes**; and, in percussion particularly, refers to the apparent differences that may readily be produced by slight **differences in the manner of percussing** or in the direction in which percussion is carried out. He also notes the differences in auscultation on the two sides, and mentions a case in which tuberculosis of the apex was suspected because conditions contrary to the normal were found on comparing the two apexes. It was discovered in this case, however, that the patient was left-handed; and it was determined that he was suffering with uncomplicated pernicious anemia. In testing vocal resonance Jones has employed with advantage a method of **listening rapidly at many points** and estimating the net result. He finds that vocal resonance is always loudest at the point at which the breath-sounds are loudest, and are always greatest at the right apex. They are loudest at the left apex only when disease is present. [It is extremely remarkable how frequently careful observation will show conditions other than pulmonary disease as the causes of slight differences in the signs on the two sides.]

I. Jundell³ discusses **percussion of the apexes** of the lungs, particularly referring to the necessity for care in the application of the finger in percussing the apexes; as the manner and direction in which the finger is applied will give varying results in different persons, or even in the same individual. One should determine the most accurate method and use it regularly. He describes his own method.

N. Kelynaek and S. R. Williams⁴ present some observations on the

¹ Deut. med. Woch., June 9, 1904.

³ Zeit. f. inn. Med., Apr. 30, 1904.

² Brit. Med. Jour., Oct. 24, 1903.

⁴ Brit. Med. Jour., Oct. 24, 1903.

Comparative value of oral and rectal temperatures in the study of pulmonary tuberculosis, having made 17,420 individual observations of 300 different patients in all stages and varieties of tuberculous disease of the lungs. They insist that sufficient attention has not been given to variations in oral and rectal temperatures in normal persons, produced by varying degrees of exercise; and note particularly that **after exercise the rectal temperature may rise several degrees**, while the oral temperature remains unchanged. They believe that when rectal temperatures are taken as the basis of prognosis, etc., a proper allowance for the physiologic rise that may follow exercise is not usually made. They depend chiefly upon **temperatures taken during rest** or at least an hour after exercise. They think that temperatures carefully taken in the mouth during rest constitute a **reliable guide in managing phthisis**. Temperatures taken in the mouth shortly after exercise are not so reliable. Temperatures taken in the rectum show somewhat higher registers than do those taken in the mouth, but are of no especial assistance as compared with oral temperatures. While if the temperature is elevated in phthisical subjects after exercise, the return to normal is somewhat more rapid than in the nontuberculous, there are no other especial differences between the tuberculous and the nontuberculous; and there is no other particular advantage in taking temperatures by the rectum in phthisical subjects.

H. Naumann¹ discusses the work previously done concerning the **blood-pressure in phthisis**, and reports his observations on 100 cases in various stages of the disease. He observed only cases that showed no albumin or sugar, and used Gaertner's apparatus. He found that 13 cases had a pressure within the normal limits; in 18 it was reduced, and in 69 **excessive**. These results are in direct opposition to those of a number of French writers, but correspond more closely with the observations made by Burekhardt. Of the 69 cases with high pressure, 28 were in the first stage; 22 in the second; and 19 in the third. The last named, however, were free from active symptoms. The author thinks that the **blood-pressure gives no valuable prognostic indication**, but is perhaps of some aid in distinguishing cases that are or are not suitable for sanitarium treatment. Hemoptysis was most common in the first stage, and particularly so in cases with high blood-pressure; but Naumann does not believe that the high blood-pressure was the direct cause of the hemoptysis.

Bouic,² discussing **night-sweats in phthisis**, refers to the fact that they are not, properly speaking, merely night-sweats, as they occur during sleep at any time. They are usually but not necessarily associated with fever. In the beginning, the sweating is chiefly about the chest and back; later, over the entire body. The author believes, however, that the diseased side of the chest sweats the most. The purpose should be, not so much to control the sweating directly, as to help the patient to eliminate the toxins through the bowels or kidneys, by giving proper medication and, particularly, **large amounts of fluid**.

¹ Zeitsch. f. Tuberc. u. Heilst., 1902

Paris, 1903.

Only in the final stage of phthisis does Bouic consider antihydrotic treatment to be really in place.

M. Loewenthal¹ reports a case of what he believes to have been **primary basal tuberculosis of the lung**, the only physical signs having been found at the base of the left lung, and the sputum having contained tubercle bacilli. He suggests the possibility of pulmonary cirrhosis and bronchiectasis and secondary infection with tuberculosis; but the fact that the patient had been sick for less than a year and had had but scanty expectoration was considered to negative this idea. [It is, of course, exceedingly difficult to be sure, clinically, that the base was primarily infected.]

J. N. Hall² reports several cases of tuberculous disease of the chest in which the striking feature was that **physical signs were absent**. There was, however, a history of cough, hemoptysis, and other symptoms indicative of the tuberculosis; and tubercle bacilli were present in the sputum. He believes these cases to have been probably due to **tuberculous disease of the bronchial glands**, with the breaking-down and the entering of the contents into the bronchial tract. [Such a diagnosis may be suspected, but it can rarely be substantiated.]

S. E. Solly³ describes a case in which he believes that **bronchiectasis developed in a tuberculous subject**.

J. Pal⁴ reports a case of venous murmur at the apex of the right lung in which he made a diagnosis of tuberculosis of both apices, with emphysema, tuberculous infiltration of the lymph-glands, and **compression or traction upon the azygos vein** at about the point at which it empties into the cava. Paroxysmal attacks of tachycardia occurred, and were attributed to irritation of the accelerator fibers of the sympathetic. The murmur was heard loudest posteriorly above the spine of the scapula. It was continuous, but was most marked at the very beginning of systole. Its character and position made it seem probable that it was venous, and its situation led the author to believe that it was produced in the azygos vein. Examination by the Röntgen-ray showed the apparent presence of enlargement of the bronchial glands; and the murmur was therefore believed to be due to the influence of this glandular enlargement upon the azygos. The attacks of tachycardia were attributed to the effect of the glands upon the accelerator fibers. The postmortem examination showed this diagnosis to be practically correct. There were adhesions at the right apex, just above the point at which the azygos empties into the cava; and at this point there were also many enlarged glands through which ran fibers of the sympathetic. The case is similar to one reported by Pel [mentioned in the Year Book in 1904], in which that author thought that there was an arteriovenous aneurysm. This explanation Pal thinks unnecessary, as he believes that the murmur might readily have been venous in that case. The attacks of tachycardia in his case could not have been due to involvement of the vagus, as this nerve was entirely free. He noticed that in the attacks of tachycardia there was a striking reduction in the blood-pressure.

¹ Liverpool Medico-Chir. Jour., 1903. ² Amer. Med., Jan. 16, 1904.

³ Med. News, Oct. 17, 1903.

⁴ Zeit. f. inn. Med., July 11, 1903.

Braillon and Jousset¹ report a case in which, they state, the **diagnosis of tuberculous endocarditis** was for the first time **established during life** and proved at necropsy. The patient presented the general symptoms of septicemia, and developed an increasingly manifest mitral regurgitant murmur. There was very marked remittancy in the symptoms. The patient also developed joint-symptoms, and ultimately showed edema and extreme cardiac incompetency. **Blood-cultures** taken on three occasions are said to have **yielded tubercle bacilli** and to have caused tuberculosis when inoculated into guineapigs. Gross and microscopic examinations at necropsy showed tuberculosis to be absent everywhere but in the heart; while the aortic, mitral, and tricuspid valves showed vegetations that contained the tubercle bacillus.

Schmidt² showed to the Vienna Medical Society the specimens from a case in which very **dangerous hematuria had been produced by ulcerating tuberculosis of the papillas of the kidneys**. He insisted upon the importance of the tuberculin reaction in obscure cases of renal hematuria.

A. Ott³ refers to the view of a number of French writers that there is in phthisis and in those predisposed to it a **loss in the mineral-substances of the tissues**, and that this fact constitutes the predisposition to phthisis. He reports a series of cases that he has investigated to determine whether this view is correct. He finds that convalescents from the disease at rest put on fat and build up other tissue, and have a tendency to retain mineral salts, as well as nitrogen and fat. He grants that there is often a demineralization in advanced phthisis. This is not, however, a constant symptom, and is certainly **not to be considered a constant symptom** in the early stages. It is apparently a product of advanced disease. It cannot, therefore, be considered to be the cause of a predisposition to phthisis.

F. X. Gouraud⁴ contributes an extensive discussion of the **metabolism of phosphorus in tuberculosis**, concluding that the determining of the excretion of phosphates has some value. If one be in doubt between tuberculous meningitis and acute miliary tuberculosis or typhoid fever, or between the chloroanemia of tuberculosis and true chlorosis, an increase in the phosphates will indicate tuberculosis, but a diminution in their amount will have no value. Phosphaturia has little prognostic value. [These observations are certainly of but slight importance, as it has been shown (see last abstract) that a noteworthy loss in phosphates does not occur in most cases of tuberculosis, and particularly that it has no greater tendency to occur in this disease than in the others mentioned.]

Diagnosis.—A. Schmidt,⁵ in discussing the diagnosis of tuberculosis, refers to several conditions which are likely to give rise to an erroneous decision that tuberculosis is present. Those especially discussed are: (1)

¹ Soc. med. des Hôp., July 3, 1903.

² Zeit. f. inn. Med., Jan. 23, 1904, p. 107.

³ Zeit. f. klin. Med., Bd. 1, Hefte 5.

⁴ Rév. de la Tuberc., Dec., 1903.

⁵ Woch., Oct. 1, 1903.

Apparent signs of the shrinking of one apex with impaired resonance over that apex, due to an **asymmetric development of the shoulder-muscles**; (2) **hemorrhages from small bronchiectases** that are very difficult to discover by physical examination; and (3) the presence of **apparent pulmonary and pleural rales** along the borders of the lungs. The author describes a number of cases to illustrate the importance of the first condition mentioned. It can usually be determined that the differences between the two apices on percussion are due to abnormalities in the conformation of the individual, if the trouble be taken to investigate the muscular structure on the two sides. This is a particularly frequent cause of error in cases of scoliosis. Schmidt also mentions a case in which hemorrhages occurred for years, without the development of any other signs of phthisis, although the condition had been diagnosed as phthisis. A careful examination of the sputum showed many small Dittrich's plugs, and he was ultimately able to discover localized rales in the interscapular space. He believes that this case was one of circumscribed bronchiectasis, and that the hemorrhages were produced in the bronchiectatic cavity. Such a condition, he thinks, is not very rare. He particularly emphasizes the importance of recognizing the fact that fine rales simulating pulmonary or pleural rales are frequently heard in persons whose lungs and pleuras are normal. These rales are heard almost entirely about the borders of the lungs—particularly the lower borders—and are especially common in persons with scoliosis. The only way in which it can be determined that these rales mean no abnormality is by making repeated examinations. When the rales are heard constantly and only along the borders of the lung, and are not influenced by coughing; and when there are no other signs of pulmonary disease, the author believes that it may be positively concluded that pulmonary disease is absent. The cause of such rales can only be suspected, and all explanations are mere hypotheses. He also notes that **rales produced in the fatty tissue and in the muscles** are occasionally heard and may readily give rise to error. [The first- and last-mentioned cases of error we have frequently noted, and consider decidedly important. Repeated hemorrhages may, of course, in the absence of tuberculosis, be due to bronchiectasis; but we doubt if this is at all satisfactory as a general explanation. Such cases are extremely important at times, and very puzzling.]

C. Roepke¹ has studied 298 cases of phthisis which had been under sanitarium treatment, with regard to the importance of **previous history in diagnosis, prognosis, etc.**; and also with regard to other points. In 75 % the disease had begun between the 18th and the 35th year; 65 % had had indoor employment. The author insists that the previous history is very important in prognosis, and to some extent in diagnosis. Only 65 of the cases showed a family history of the disease. In 42 % of the cases **hemoptysis was the first symptom** to bring the patient to a physician; 55 % complained of pain, and Roepke **considers pain in the shoulder to be very important**, and likely to be confounded with

¹ Beitrz. Klinik d. Tuberk., Bd. i, Heft 3.

rheumatism. He insists upon the importance of listening to the breath-sounds immediately after cough in searching for rales. The disease was most frequent at the right apex, and the author states that in two of the cases in which the left apex was affected the patients were left-handed; so that muscular activity of the right side is a possible predisposing cause. He thinks that the **albuminuria of early phthisis may often be due to overfeeding.** In one-third of the patients in the second stage of the disease sputum-examinations were negative. Examination of the sputum cannot be relied upon very strongly. The author thinks that tuberculin is an excellent method of diagnosis. In about 90 % of his cases a positive diagnosis was reached by this means. It was used in 45 of the cases.

Fernet¹ considers that **enlargement of the axillary glands** is a point of importance in early tuberculosis of the lungs. He thinks that one may frequently discover a number of small glands, in early phthisis, deep in the axilla or against the thoracic wall, and that these are not found in normal persons. They are not tender. He finds them more frequently in early than in advanced tuberculosis. The cervical glands are not infrequently found enlarged in the same circumstances, but less commonly. [This observation has a certain degree of importance, as enlargement of these glands is common in early phthisis. There is no question, however, that such glands are frequently found, when carefully looked for, in persons who have no indication of this disease. Scattered enlarged glands are much more common than they are usually thought to be.]

Remouchamps² describes so-called **laryngeal crepitation** in pulmonary tuberculosis. The examiner places his ear at a distance of from 5 cm. to 10 cm. from the patient's mouth. The patient breathes with his mouth open, and a fine crepitation is heard during both inspiration and expiration, particularly the latter. Remouchamps believes that it occurs throughout the whole course of phthisis, and is of value in diagnosis. [We are extremely skeptical concerning its value.]

E. Kőrmöczy and K. Jassniger³ have made a study of **Jousset's inoscopy** (described in von Behring's article). In the first place, they observed that the method is much more **difficult to carry out** than the descriptions of it indicate, as the preparations are difficult to fix on the glass slides. They also note the danger of mistaking other carbol-fuchsin stained objects for tubercle bacilli, particularly hemoglobin-crystals in blood-coagulum. These are extremely difficult to distinguish at times. The authors give notes of 3 cases of pleural effusion in which they obtained positive results; and of 5 cases in which they got negative results, although the fluid had certainly come from tuberculous persons. In the cases of miliary tuberculosis, 4 in number, they obtained a positive result from the blood in one instance, a doubtful result in one, and a negative in the other two; the blood having always been obtained post-mortem. In a case of hepatic cirrhosis and in one of tuberculous peri-

¹ Bull. de l'Acad. de Méd., 1903.

² Deut. med. Woch., Mar

tonitis they got negative results. They conclude that the method does not by any means always give positive results; and **while it is of some value, it is of limited importance**, on account of its uncertainty.

L. v. Kétly and A. v. Torday¹ have made an extensive study of the **importance of cytodiagnosis in pleural and in peritoneal effusions**, giving notes of 42 cases. They conclude that in primary tuberculous pleurisies one finds, as a rule, throughout the whole time that the exudate persists, lymphocytes in large numbers, with some red corpuscles mixed with them. Endothelial cells are found only in small numbers. In secondary acute tubercular pleurisies the picture is usually the same; but sometimes polymorphonuclear cells are found in greatest numbers in the earlier stages, and there may also be some endothelial cells. The leukocytes disappear soon, however, and are succeeded by lymphocytes. Chronic tuberculous pleurisy may have exactly the same appearances as are found in Bright's disease and in disease of the heart, there being a mixed picture. In such exudates it is often difficult to tell one form of cell from another. In Bright's disease and in heart-disease there are usually many endothelial cells and, later, many lymphocytes. The fluid in a cavity should be called a transudate, on the basis of cytodiagnosis, only when there are evidently a great number of endothelial cells present. The picture in pulmonary infarct is not different from that in renal or cardiac disease. In pneumococcus pleurisy there are large numbers of polymorphonuclear leukocytes and endothelial cells. The conditions just mentioned refer exclusively to pleural effusions; in peritoneal effusions of various kinds lymphocytes and endothelial cells are found in large numbers, and even in tuberculous peritonitis there may be large numbers of polymorphonuclear leukocytes. If such a condition is found in tuberculous peritonitis, however, one should look for a possible complication. **Cytodiagnosis may be used to determine the presence of primary tuberculous pleurisy**, this being indicated by the presence of a lymphocytosis in the very early stages. The authors think that in cases of rapid onset, in which other distinct evidences of tuberculosis are absent, cytodiagnosis is of much importance. **In the later stages it is of less importance.** Mistakes in the use of cytodiagnosis are possible; but when it is employed with a proper critical spirit, it is a valuable method of examination in pleurisies. [Cytodiagnosis is not worthy of much reliance, though it may occasionally help somewhat.]

R. Schlüter² discusses the **diagnostic value of tuberculin-reactions**, particularly their frequency when tuberculosis is absent; and also the frequency with which they may be obtained in persons that have had tuberculosis, but in whom the disease has become latent. He gives a brief discussion of the last 100 injections carried out in the clinic at Rostock. Of these, 70 were entirely negative, and in none of these patients was there clinically any suspicion of tuberculosis. On the basis of the investigations of Naegeli and others it is extremely probable that

¹ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 1 u. 2.

² Deut. med. Woch., Feb. 18, 1904.

a large proportion of these persons had old, latent, healed tuberculosis. Hence, Schlüter believes that **those that are free of the disease or have inactive, old foci do not react**, or react only with great rarity. Thirty reactions were positive. In 22 of these persons the diagnosis could be made readily by other methods. In 4, tuberculosis was very seriously considered. In the remaining 4 there was no serious suspicion of tuberculosis; but, in the light of the reaction, Schlüter thinks that the disease was present in all except in 1 case, that of a patient with pernicious anemia, in which postmortem examination apparently showed an entire absence of tuberculosis. The reaction in this patient, however, had been doubtful; and similar reactions had often occurred spontaneously. The author holds that the tuberculin-reaction is probably **subject to but slight error**. He believes that the only satisfactory method of determining its value finally is to use it in a large number of cases in which there is no serious suspicion of the presence of tuberculosis. [This is a pertinent suggestion and has, as yet, not been sufficiently used by those who have studied the value of tuberculin.]

R. Milchner¹ reports a case in which **pseudotubercle bacilli were present in bronchiectasis** [this case having previously been referred to in the Year Book]. The patient was a man of 52 years, and had for years had **repeated hemoptysis, with cough and expectoration**. Acid-fast bacilli were found in the sputum. There was bronchial breathing, and rales were heard in the lower portion of the left lung. In spite of the appearances of tuberculosis, the patient repeatedly improved greatly; and, owing to the doubt produced by this circumstance, animal inoculations were made from the sputum. These proved entirely negative. The patient ultimately died of cardiac weakness, and necropsy showed an astonishing degree of bronchiectasis. There was a bronchiectatic cavity the size of a small apple. Objects that appeared to be vessels projected into this cavity. Careful gross and microscopic examinations of the lungs showed no evidence of tuberculosis. The author attempted to study the relation of these bacilli to the tissues, but found it impossible to determine that any were present. Some other studies, however, led him to believe this to be due to the fixing in alcohol or formalin, either of which interferes with the subsequent staining of the bacilli. The man had come much in contact with horses, and it is **possible that he had been infected with the hay-bacillus**. Milchner studies literature and reaches the conclusion that these bacilli rarely give rise to error in the diagnosis of tuberculosis.

Treatment.—H. O. Probst² discusses the question **whether consumptives should be excluded from schools**, and decides that an absolute rule to this effect is not necessary; but that every consumptive attending a school should be required to carry out proper measures to prevent his communicating the disease to others, and that teachers should be instructed in the care of consumptives.

L. Brown³ analyzes **1500 cases of tuberculosis discharged from**

¹ Berl. klin. Woch., July 20, 1903. ² Columbus Me. 1904.
³ Jour. Am. Med. Assoc., Nov.

the **Adirondack Cottage Sanitarium**, from 2 to 18 years, before the report was published. He finds that 33 % are still alive, 38 % dead, and 29 % untraced. Of the 497 known to be living, 22 % are well, 4.6 % arrested, 3 % relapsed, and 3.7 % chronic. Of all that have been traced, 31 % are well and 6.5 % arrested; while 53.3 % are dead. Of the incipient cases that were traced, 66 % are well. Of the advanced cases traced, 28.6 % are well. Of the far-advanced cases traced, only 2.5 % are well and 90 % are dead. It is highly probable, however, that a large proportion of untraced cases are dead. These figures are, therefore, somewhat too favorable. [But they are sufficient evidence of the efficacy of sanitarium treatment as compared with old-fashioned methods.]

Pollatscheck,¹ in discussing the treatment of **disorders of the upper respiratory passages in tuberculosis**, refers to the frequency with which cough is due to dryness of these air-passages. He particularly recommends cleaning out the nasal cavities with a warm 2 % solution of soda bicarbonate; or, in dry pharyngitis, introducing a few drops of vaselin oil into the nose in the evening. He finds that this often induces sleep more readily than does administering heroin, and that it controls the cough better. Dryness of the larynx also frequently produces cough, and may be treated with local anesthetics and by applying cold over the neck. The author has tried anesthesin and found it excellent, in combination with menthol, for treating laryngeal conditions. He uses it as an emulsion, which may be either injected into the larynx or inhaled.

J. Burnet² discusses the use of **ichthyol** in the treatment of disease of the lungs, particularly referring to its employment in pulmonary tuberculosis. He reports 13 cases treated by this method, all of which he believes to have been distinctly improved. He finds that the drug is well taken if given in a capsule. He has given from 30 to 80 grains a day. He also particularly mentions 2 cases of bronchiectasis in which the results of ichthyol-treatment were strikingly successful. He has likewise obtained good results in the treatment of chronic pulmonary fibrosis, as seen in stone-masons.

G. Cavazzani³ refers to his previous observations upon the favorable effect of **garlic** upon pulmonary tuberculosis, and reports his results in treating guineapigs with garlic-juice and afterward insufflating dried and powdered sputum from tuberculous patients. As compared with controls, he believes that the guineapigs treated in this way showed very slight lesions and no distinct evidences of tuberculosis.

W. Koch⁴ has had encouraging results from the hypodermic use of oil of camphor in doses of one grain every 4 days, followed by a 10-days' pause and then by a repetition, according to Alexander's directions. Since this was a difficult treatment to carry out, he used **camphor percutaneously**, putting it up in a preparation called **percutilan**. He has also had excellent results from this in some cases of emphysema

¹ Therap. d. Gegenw., Sept., 1903.

³ Lancet, Jan. 9, 1904.

² Lancet, Aug. 8, 1903.

⁴ Berl. klin. Woch., May 2, 1904.

and bronchitis, particularly, causing free expectoration and general improvement.

F. Hare¹ refers to his previous observations concerning the **influence of inhalations of amyl nitrite upon hemoptysis**, and describes some cases in which this treatment has been used with immediate success. In the few cases in which he has so far used it, he has not seen even a comparative failure. He believes that the drug is likely to prove particularly useful; for, if it acts, it does so by checking the influx of blood to the ulcerated lung-tissue, thus preventing the flooding of this tissue and the evil effects of putrefaction, etc., as well as stopping the hemorrhage.

D. I. Chowry-Muthu² discusses the treatment of pulmonary tuberculosis with **formaldehyd**, describing his **own inhaler**; and insists that the vapor probably may and does reach the pulmonary alveoli. He states that, from his experience of 5 years, he has concluded that formaldehyd-inhalation is a distinct aid to the open-air treatment. He has also employed the **intravenous injection of formaldehyd** in 25 cases, having given about 500 injections. He thinks that the results have been excellent, and mentions 2 cases in particular in which remarkable results were obtained. He states that in 5 cases of acute disseminated tuberculosis the disease was arrested by this treatment. The electric method of using formaldehyd he has under observation. While it has apparently been successful, he has not reached a decision as to its value.

T. W. Dewar,³ in a preliminary report on the treatment of advanced pulmonary tuberculosis by **intravenous injections of iodoform**, states that he has successfully used intravenous injections of iodoform dissolved in ether, giving as much as 6 grains of iodoform at a dose—although usually less. He claims most striking results, even in advanced cases. He says that successful injections into the veins are painless; and that if an injection causes pain, it is because it has failed to reach the vein, in which case it should at once be discontinued. He has been able to carry out this treatment for months at a time. There are sometimes symptoms such as breathlessness and palpitation, but, as a rule, no such results follow. The injections are likely to bring out fine crepitant rales at areas of previously obscure disease. They are, therefore, Dewar thinks, valuable from a diagnostic standpoint. [We are, we think, justified in maintaining skepticism concerning this treatment or that with formalin.]

J. C. Bowie⁴ reports his results in treating tuberculosis of the lung with **high frequency, low potential currents and intralaryngeal injections of antiseptics**, such as iodine, thymol, menthol, or guaiacol. He describes a number of cases treated with this combined method, and considers the results extremely encouraging.

P. Reckzeh⁵ has made some observations as to the **influence of**

¹ Australasian Med. Gaz., Feb. 20, 1904. ² Brit. Med. Jour., Oct. 24, 1903.

³ Brit. Med. Jour., Nov. 21, 1903. ⁴ Lancet

⁵ Berl. klin. Woch., N

the inhalation of lime-dust on pulmonary tuberculosis, reaching the conclusion that no good effect is observed; and that sometimes the effects are bad. He thinks that there is no reason for continuing any observations of this kind.

E. Maragliano¹ gives a general discussion of his work on the **specific treatment of tuberculosis**, insisting that he preceded von Behring by a number of years in the use of what he thinks was practically that author's method in the treatment of tuberculosis. In a general discussion of his results, Maragliano says he thinks he has established the fact that **immunizing substances** from immunized animals, when **taken into the digestive tract, pass into the circulation** and have an action analogous to that of serum-injections. He believes that a local focus of tuberculosis, when it heals, often renders the patient subsequently immune to the disease. This has led him to attempt to produce a mild local tuberculous reaction in the tissues on the surface of the body. He states that he has found a substance that does not contain the living bacteria, but will produce a "tuberculous phlegmon." He also states that inoculations carried out in this way have **caused the production of antitoxic, bacteriolytic, and agglutinating materials**; and have made animals immune to intravenous injections of virulent cultures that always killed controls. He has begun to use this method in man also. He states that it causes a **localized tuberculous ulcer with sterile pus**. This ulcer lasts for 2 or 3 days, and then all the symptoms disappear. The blood of persons so treated acquires, he says, a high degree of agglutinating power. He believes that it will prove to be a useful method of producing immunization in human subjects.

A. Marmorek² reports his most recent work on the production of an **antituberculous serum**, discussing his view that the tubercle bacillus produces not only tuberculin, but also another toxin, and presents his reasons for thinking so and for believing that the young microbes, especially, produce a large amount of this toxin. In order to maintain the primitive characters of these young bacilli, he has used culture-mediums containing a leukocytic serum, and also one consisting of glycerinated liver-bouillon. He claims that in this way he has obtained a large amount of the supposed toxin, and that, by injecting this into horses, he has produced a serum afterward used by him for treating human and experimental tuberculosis. His results with human subjects are not mentioned in detail, but he claims excellent effects—particularly in surgical tuberculosis.

J. Goldschmidt³ discusses the value of Marmorek's tuberculosis-serum and mentions his own results with it. With the old serum of Marmorek the author treated 4 cases of tuberculosis of the bone. These were apparently improved at first; but, on the whole, he could not determine that the result was very different from that with tuberculin. Two years later he saw Marmorek treat 2 cases of advanced tuberculosis of the lungs with his improved serum. The results in these cases were

¹ Med. News, July 4, 1903.

² Lancet, Dec. 12, 1903.

³ Deut. med. Woch., Dec. 17, 1903.

entirely inconclusive, one patient having soon afterward died of pneumothorax, and the other having withdrawn from treatment. With Marmorek's new serum, Goldschmidt has seen 1 patient treated, and the result was either **wholly inconclusive or unfavorable to the serum**. He discusses the characteristics of the new serum, and says that he believes it **has no logical basis**. He considers it important to determine whether tuberculosis-serum may not be produced by using apes. In conclusion, he states that he thinks it extremely dangerous to use Marmorek's serum with any freedom, particularly in patients with fever and with advanced disease. [The scientific value of Marmorek's work is very questionable. It does not seem a rational preparation or a safe treatment.]

F. F. Friedmann¹ has investigated the **immunization of animals by means of tubercle bacilli derived from the tortoise**. He states that he has been able to produce distinct immunity in guineapigs by injecting bacilli from the tortoise. They produced a local reaction in the tissue, which softened and discharged a soft, caseous secretion, but healed completely. He believes that since the very susceptible guineapig can be protected by this means, other animals can almost certainly be protected in the same way.

F. F. Friedmann² discusses active immunization against tuberculosis, with particular reference to the use of tubercle bacilli from cold-blooded animals in immunizing guineapigs. He has chiefly devoted himself to the bacilli obtained from tortoises. Such bacilli, he believes, have especial value in this connection, on account of their power of growing within a comparatively wide range of temperature and of the entire similarity of their cultures to those from mammals; also because they produce in guineapigs a mild localized lesion, but cause absolutely no general results in any mammals so far tested. Since his first publication, Friedmann has used a culture obtained from a second source (also a tortoise bacillus), and has found it to have a much less markedly protective power; probably because the bacillus does not grow well at the temperature of the blood of mammals. He used a smaller number of immunizing injections than did Moeller. He reports several observations that he has made in guineapigs, which he has succeeded in protecting against infection with human tubercle bacilli, while control animals died.

PNEUMONIA.

D. L. Edsall and A. A. Ghiskey³ report a small **hospital-epidemic of pneumococcus-infections** in which 2 cases of pneumonia developed in a bed in which there had been an extremely severe case of pneumonia with a fatal termination; and in which there were observed 2 cases, one in this bed and one near by, in which pure cultures of pneumococci were obtained from the circulation, the patients being subjects of typhoid

¹ Deut. med. Woch., Dec. 10, 1903.

² Deut. med. Woch., Jan. 28, 1904.

³ Therap. Gaz., May, 1904.

fever. Subsequently to this the ward was formalized, and the epidemic ceased. The authors insist that the literature clearly shows that pneumonia may be spread through direct contagion and through some definite local source of infection other than direct contagion, as well as through widespread atmospheric dissemination. They also refer to the literature concerning the viability of the pneumococcus, which demonstrates that this organism may remain viable and virulent for a long time. In discussing the control of pneumonia, they insist upon the **importance of keeping pneumonia-cases isolated**, as far as possible, in private houses, and well separated from other cases in hospital-wards. They also insist upon the importance of sterilizing the bed-clothes, and of thoroughly cleansing and, as far as possible, sterilizing the floor, the furniture, etc. The cases described were interesting, also, because the infections were extremely mild, while it has often been stated that epidemic pneumonias are very virulent. The cases likewise demonstrated that pneumonia may have a **period of incubation less than 48 hours** in duration.

A. C. Klebs¹ discusses the **relative importance to the community of pneumonia and tuberculosis**. He refers to various hospital statistics, which indicate that the mortality of pneumonia is, on the average, about 23.8 %. He thinks that the prognosis of the disease is relatively good in healthy and temperate persons. He particularly refers to the United States Census Reports, which apparently show that the **great increase in pneumonia has been almost entirely in children** under five years of age. This, he thinks, is due to the fact that **various conditions other than lobar pneumonia** are included under the term pneumonia; and he believes that this gives a distorted idea of the importance of the disease, and that in the mortality-figures usually quoted true lobar pneumonia plays only an inferior rôle. He thinks that action directed toward diminishing alcoholism will do more good than general hygienic measures in controlling the mortality from pneumonia; these latter measures, he believes, have had little or no influence upon the disease. [A view with which we do not agree. Pneumonia has not, as yet, as it should be, been treated, hygienically, by any considerable number of physicians, as an infectious disease.] He does not think that pneumonia can be compared with tuberculosis in its economic importance. On the other hand, the conditions in regard to tuberculosis have been greatly improved as the result of hygienic measures. Klebs knows of no fundamental information in regard to pneumonia that will permit of a scientific attempt to control it.

W. T. English² discusses **traumatic pneumonia**, referring to the variety due to contusions, and not to perforating injuries of the lung. He believes these cases to be very frequent, and cites the history of several in which blows had been received upon the chest or there had been a violent fall upon the chest, and in which pneumonia developed soon afterward. In one case such an injury occurred, and 10 days subsequently the patient expectorated a large quantity of dark blood in which

¹ Amer. Med., Dec. 12, 1903.

Jour. Am. Med. Assoc., July 25, 1903.

there were molds of the bronchial tubes. This was followed by the development of the signs of pneumonia; and subsequently to this, signs of **pneumothorax** of the opposite side. This patient finally developed empyema on the pneumothorax side, and died of phthisis about 2 years after the injury.

Symptomatology.—J. McCrae, J. C. Fyshe, and W. E. Ainley¹ publish an analysis of 486 cases of lobar pneumonia and of 100 autopsies. Among the points they mention are the following: Crisis occurred in 60 %; lysis, in 28 %. The temperature fall was atypic in 12 %. When the time could be determined, crisis occurred, on the average, after 7.1 days. When lysis occurred, it began, on the average, after 8.4 days. Delayed resolution was found in only 9 cases. Rusty sputum was present in 44.9 %. Mania was noted in 8 cases. All the last, with one exception, were in children. Jaundice occurred in but 3.8 %; albumin, in 22 %; casts, in 1.5 %; and albumin and casts, in 25.7 %. Leukocytosis was present in 43 out of 45 cases. The average in the patients who recovered was exactly the same as in those who died. **The clinical extent of the pneumonia influenced the prognosis decidedly.** Those with three lobes involved showed 46.1 % mortality. Among the complications it is noteworthy that there were 4 cases of thrombosis, 2 being saphenous and 2 intracranial. There were 16 cases of acute endocarditis. Of the autopsy figures, it is noteworthy that the age in the clinical series in the different hemidecades and that in the autopsy series in the different hemidecades corresponded quite closely. The figures given for lung-involvement demonstrate that the amount of lung-tissue involved has a direct bearing upon prognosis. About 60 cases were examined bacteriologically: 65 % showed the pneumococcus, 5 % being a mixed infection; 20 % were mixed infections of other kinds. The streptococcus was the main agent in 8 %. Wyatt Johnston stated that the spleen is rarely enlarged in cases of infection with the pneumococcus, while it is frequently enlarged in other infections. The figures obtained in regard to this point tend to substantiate this view. Some interesting comparisons between the clinical diagnoses of complications and the postmortem diagnoses of these complications are given. Clinically, for example, pleurisy was noted in 38 %; at necropsy, it was found in 91 %. Pericarditis was noted clinically in 3.4 %; at necropsy, it was found in 17 %. Endocarditis was noted clinically in 3 %; and found at necropsy, in 7 %. Of the 16 cases of pericarditis, 11 showed involvement of the left lung. The authors note that **immigrants showed an especial liability to the disease**, as did also those with outdoor occupations.

F. S. Dawe and E. C. Austin,² in discussing 70 cases of lobar pneumonia with the clinical and postmortem observations on them, note that of 26 cases observed at autopsy, the **lymphatic glands about the trachea were found enlarged in 17**. They also note that 135 patients under treatment for tuberculosis of the lungs showed no case of pneumonia throughout a year; while the other cases in the same in-

¹ Amer. Med., Jan. 23, 1904.

² Lancet, Feb. 20, 1904

firmly showed 70 instances of pneumonia. There were 8 cases of apical pneumonia, with 5 deaths; but the deaths were due chiefly to advanced age and to lesions in other organs. They consider a pulse-rate above 120 to be a very serious prognostic sign. Crisis occurred in 29 cases; lysis, in 7. They refer particularly to the cases in which coma is the chief symptom, and to the danger of mistaking these for cases of uremia; also to the class likely to be admitted as lunatics, on account of the violent delirium, this being particularly the case with alcoholics. [Atypic onset, lack of crisis, and apical pneumonia must be much commoner than they were, or else the statements in many text-books are based upon erroneous tradition, rather than upon facts.]

J. Hay¹ discusses his observations in 200 cases of pneumonia. He particularly notes that the mortality in 150 cases was, in patients below 20 years of age, 9.1 %; in those between 20 and 50, 41.5 %; and in those over 50 years old, 75 %. Over 43 % of all the patients had taken alcohol to excess. He especially insists upon the **frequency and importance of distention of the abdomen in pneumonia**, and its interference with the proper action of the thoracic organs [a point of real importance]. He **considers the use of alcohol in the treatment to be extremely objectionable**. Comparing the mortality in those treated with alcohol with that in those treated without, he finds the former to be 29.5 %, and the latter, 45.5 %. He considers ammonium carbonate in doses of 10 grains every 4 hours, with occasional additional doses of 20 to 30 grains, to be an excellent method of treatment.

L. A. Conner and G. E. Dodge² contribute an interesting study of the **physical signs in lobar pneumonia** as seen in the cases admitted to the Hudson Street Hospital, in New York city, between 1896 and 1902. Satisfactory study of 392 cases could be made, these having been almost exclusively under the observation and care of Conner. The authors first refer to the discussion concerning the **earliest signs of lobar pneumonia** and to the question whether a weak respiratory murmur is frequently present over the involved area. They found feeble breathing present in 98 cases when admitted, these cases having been all in the early stage of the disease, and having constituted 79 % of those admitted in the early stage. As to the first stage of the disease, the authors conclude that the **relative frequency and importance of the physical signs are as follows**: (1) A circumscribed area of feeble and indistinct breathing as compared with the breathing at a corresponding point on the other side. The patient, if possible, should be in a sitting posture when examined. (2) A circumscribed impairment of resonance, with or without a tympanitic quality; this sign should be elicited with the patient sitting up. (3) Crepitant rales. (4) A slight increase in the intensity and the clearness of the vocal resonance. In the second stage, the bronchial quality of the breathing is first noted in connection with expiration, the period of its appearance being quite variable. It was observed on the fourth day in more cases than on any other day. The signs of the stage of resolution are, first, a gradual

¹ Lancet, June 11, 1904.

² Am. Jour. Med. Sci., Sept., 1903.

disappearance of the bronchial breathing, which occurred in 24 % of the cases before defervescence, and in the others at a variable time afterward. In only 10 % of these cases did bronchial breathing persist more than 7 days after defervescence. In 2 cases loud pure amphoric breathing, lasting several days, was noted after defervescence. In 1 case this was associated with a clear, tympanitic percussion-note and with a lessened resistance to the finger. **The signs in this case resembled those of pneumothorax.** It is possible that these signs were due to proximity to the distended stomach. [We have seen it over the back, on the right side, however.] In discussing central pneumonia, Conner and Dodge express their belief that this condition as usually conceived of—namely, as a consolidation beginning in the depths of the lung and being at that time not definitely discoverable, but progressing toward the surface and becoming evident—does not occur. They think that a pneumonia, even when deeply seated in the lung, produces physical signs that are discoverable; and that the so-called central pneumonia is really a stage of imperfect consolidation that gradually progresses to complete consolidation. [The latter statement, as a general one, is subject to decided doubt.]

J. M. Bennion¹ reports a case of lobar pneumonia in which the crisis occurred on the thirteenth day. About 10 days thereafter the temperature rose again; and, in all, **for 8 weeks there was a very high but extremely irregular temperature**, and the physical signs in the lungs persisted. All the abnormalities cleared up, however, at the end of this time, and the patient recovered entirely. There was no evidence of empyema. Tuberculosis was considered, but could not be demonstrated, for there was no sputum.

L. Kredel² reports a rare case in which, following pneumonia, there were symptoms of **embolism of the right leg**, which ultimately led to gangrene and necessitated amputation. Dissection afterward showed a thrombus in the popliteal artery. The source of the embolism could not be determined, although it was considered probable that it had come from a heart-thrombus.

P. Rose,³ in connection with the many cases of **thoracic disease simulating acute abdominal trouble** that have recently been reported, refers to the case of a girl 5 years of age who had marked abdominal pain and a great deal of straining at stool. Intussusception was thought to be present; but the child was admitted to the hospital and was found to have pneumonia, while no intussusception was discovered. She died of pneumonia the same evening. Postmortem examination showed consolidation of both lungs; but there were also **extravasations of blood into the submucous tissue of the intestine**, at the ileocecal junction. The lower part of the ileum was very edematous; and the glands were much swollen. There were also extravasations into the mesentery. The conditions looked as if there had been a small intussusception which had slipped back. The author thinks that in this case the in-

¹ Lancet, Jan. 16, 1904.

² Zeit. f. klin. Med., Bd. lxxi, Riegel Festschrift.

³ Lancet, Nov. 7, 1903.

testinal condition was primary, and was the cause of the infection producing the pneumonia. He notes that in 7 cases of thoracic disease in which abdominal symptoms were present, the reports of which he has seen, 2 patients had sustained blows on the abdomen, one had a nonperforated gastric ulcer, another had a history of the same disease, and a fifth had been constipated for 12 days. He considers it not impossible that abdominal disease had actually been present in these cases. [In view of the experimental results with pneumococcus-inoculations in animals it is an interesting question whether these severe abdominal symptoms may not be due somewhat frequently to actual disease of the intestines set up by the pneumococcus.]

Prognosis.—I. Owen,¹ in discussing **edema of the lungs** and its importance as a cause of death, refers, among other points, to the **mode of death in pneumonia**. He considers that too much stress has been laid upon the heart in this connection, and believes that the usual terminal stage is respiratory and not cardiac failure. [Recent work seems to show that it is chiefly a vasomotor failure.] Owen thinks that there is too much fear of cardiac failure; and that this deters many from making proper examinations of the back of the chest, which, he thinks, should be regularly done. As soon as signs of edema appear, active treatment against it should be undertaken. One **should especially look for dilation of the right heart** and obstruction of the venous circulation. If such conditions are present, venesection, he thinks, should be resorted to at once. If this is not done, one may leech, apply dry cups, etc.; and follow this by digitalis and similar drugs. He insists that the **continuous administration of alcohol in such conditions is useless, if not dangerous**. The most important drug he considers to be strychnin administered hypodermatically.

F. C. Kinsey² has made a series of **blood-cultures in 50 cases of pneumonia**. In the first 25 he took from 8 cc. to 9 cc. of blood, placing this in 50 cc. of bouillon. Of these 25 cases, only 3 gave positive results. Of these 3 patients, 1 died. Of the negative cases, 11 patients died and 11 recovered. In the second group of 25 cases the dilution used was greater, 1 part of blood being added to 15 or 20 of bouillon. Of these cases, 19, or **76 %**, were positive; and of the 6 negative cases, cultures were taken in at least 2 at a period when one could hardly expect positive results. In 2 cases blood-cultures were positive when the temperature was subnormal. The author believes that, by using proper methods, the pneumococcus will probably be found in the blood of every pneumonia-patient. He thinks that the **prognostic value of positive cultures is practically nil**. Of the 19 positive cases in the second series, 69 % recovered; while of the negative, 33 % recovered and 67 % died. As a rule, however, few pneumococci were found in the positive cases that recovered.

Stuert³ has made a study of the **virulence of the sputum in the course of croupous pneumonia**, with especial reference to the value

¹ Brit. Med. Jour., Jan. 2, 1904. ² Jour. Am. Med. Assoc., Mar. 19, 1904.

³ Zeit. f. klin. Med., Bd. lii, Hefte 5 u. 6

of such studies in establishing a prognosis. He finds that by injecting white mice one may determine with considerable accuracy the virulence of the sputum. Although by this means one cannot always reach definite conclusions as to the virulence that the pneumococcus will exhibit in man, the result of the injections and the course of the disease in man correspond so closely as to make the matter of considerable practical importance. An interesting point observed was that the crisis is not immediately associated with a reduction in the virulence of the organisms in the sputum, the virulence remaining high for at least 24 hours afterward. Hence the **crisis is not caused by destruction of the virulence of the pneumococci**. Stuertz finds that exacerbations or relapses in pneumonia are accompanied with exacerbations of the virulence of the organisms, and that these changes in the virulence can be determined more rapidly than can physical changes in the chest. He thinks, therefore, that one may anticipate their occurrence by injecting sputum into mice every morning and evening when the case is very important and severe.

Treatment.—E. F. Ingalls¹ has treated a series of cases of pneumonia with **thiocol**, without any very evident effect upon the course of the disease.

H. L. Elsner² discusses the **treatment of the cardiac toxemia of pneumonia**. He strongly **objects to the use of nitroglycerin**, as it increases an already dangerous degree of vasomotor relaxation. He particularly recommends employing remedies that support the heart and bloodvessels, especially strychnin, digitalis, and suprarenal extract or adrenalin.

PNEUMOCOCCUS SEPTICEMIA.

J. Zahorsky³ discusses a series of cases of **pneumococcic infection of the respiratory tract** in their relation to common epidemic "colds." He insists that the common practice of calling many such conditions grip is pernicious. In the epidemic observed by him a great many persons had more or less **violent catarrhal symptoms** along the respiratory tract; while, at the same time, an epidemic of pneumonia was present. Sometimes many cases of catarrhal disease of the respiratory tract occurred in families in which croupous pneumonia was present. In children the symptoms, even in the absence of pneumonia, were sometimes severe; although they were usually mild in adults. The author made 26 bacteriologic examinations of the secretions, and Snodgrass made 12. An organism whose morphology corresponded with that of the *Diplococcus lanceolatus* was found to be present in considerable number in all but 6 instances. Zahorsky believes that **lobar pneumonia is only an incident in the course of widespread pneumococcic infection**.

C. P. Howard⁴ reports **three cases of pneumococcic arthritis**.

¹ Med. News, Oct. 17, 1903.

² N. Y. Med. Jour., Jan. 2, 1904.

³ Inter-State Medical Journal, Feb., 1904.

⁴ Johns Hopkins Hosp. Bull., Nov., 1903.

In the first case, culture from the joint involved, made during life, was positive. He also refers to the literature since the appearance of R. M. Slaughter's paper, and states that he finds the total of the cases of pneumococcic arthritis to be now 72.

RHEUMATISM.

F. J. Poynton¹ reports a fatal case of rheumatism, particularly insisting upon its relation to the **infective nature** of rheumatic fever. The case was one that ran the course of malignant endocarditis, the child having previously had rheumatic arthritis. Bacteriologic examination postmortem showed the organism previously described by Poynton and Payne, this organism having produced arthritis, endocarditis, and pericarditis in rabbits and monkeys. Poynton believes that the infective nature of this rheumatism, with its relation to this organism, has been demonstrated with absolute clearness. [An editorial discussion of this article makes the perfectly correct criticism that it has by no means been shown that in this case the organisms found were not present in consequence of a terminal infection unrelated to the rheumatism.]

E. S. Hawthorne² describes 5 cases of rheumatism in which he thinks that there was **direct infection** from case to case. All the patients had come into direct contact with the previous case shortly before the outbreak of their own illness.

K. Korowicki³ has made a series of investigations of the **blood in 14 cases of rheumatism** in young adults, about half of these cases having been complicated with endocarditis. The **changes found were comparatively slight**. The specific gravity and the number of red corpuscles were somewhat decreased and a slight leukocytosis occurred; the latter, however, was not marked enough to be of importance. Morphologically, there were no noteworthy changes in the red cells. The white cells showed some increase in the mononuclears and eosinophiles. The author attributes the marked pallor of many rheumatics to **contraction of the peripheral vessels**. Sweating may cause a concentration of the blood, but only in the markedly febrile stage.

A. M. Edge⁴ reports a case of **rheumatic hyperpyrexia**, the temperature reaching as high as 110°, and being resistant to treatment. It lasted in all 7 days, and terminated fatally. Necropsy showed that the case was one of pure hyperpyrexia, without any complication except terminal pulmonary congestion.

Treatment.—J. Sigel⁵ discusses the therapeutic value of **rheumatin**, a salicylic-acid-quinin compound. After having used it in about 40 cases, he has reached the conclusion that it is an excellent salicylate-preparation, whose effect upon rheumatic conditions is as good as that of other

¹ Brit. Med. Jour., May 14, 1904. ² Brit. Med. Jour., Dec. 26, 1903.

³ Deut. Aerzte-Zeitung, 1903, Heft 11.

⁴ Brit. Med. Jour., Nov. 21, 1903, p. 1335.

⁵ Berl. klin. Woch., Aug. 3, 1903.

salicylic preparations; and that it is much freer from unfavorable collateral effects than are these other preparations, even aspirin. He thinks that it is especially **valuable when there are cardiac or renal complications**, or when other preparations irritate the stomach; also in case the condition becomes subacute or chronic, and one wishes to alter the form of salicylate given—a procedure that sometimes has useful results. If this preparation has no effect after several days' use, there is no propriety in continuing to employ it. It may be given for neuralgic and purely nervous pains.

B. Aronsohn¹ has made a study of the influence of **mesotan** in rheumatic disorders. He has secured excellent results; although he reports that **severe eczema occurred in two cases** and necessitated the abandonment of the drug.

G. H. Sherman² reports a series of cases treated with **antistreptococcic serum**, 9 of which were instances of rheumatism. He notes, as the result of this treatment for rheumatism, decided improvement after the first or the second dose, and complete recovery within a comparatively short time. He thinks that the serum is valuable as a method of therapeusis. [We have had some experience in the use of this serum for rheumatism; and, with some other observers, have found the results to be very inconclusive.]

VARIOLA.

V. Wasielewski³ has made a careful study of the **Cytoryctes vaccinae**—the vaccine bodies described under this name by Guarineri. He decides that these are the only characteristic objects found in the skin and the mucous membranes in cases of variola and of vaccinia, and that they are absent in normal persons. He believes that they certainly are not leukocytes or degeneration-products. They can be **inoculated into the epithelial cells of the cornea of the rabbit** by introducing vaccine lymph. No micro-organisms can at first be found, microscopically or bacteriologically, in the area of inoculation, and the vaccine bodies can be found throughout a great many generations. The latter he considers to be probably the cause of vaccinia.

D. Sivewright⁴ has made a study of the epidemic of smallpox in London during the winter of 1901-2, with regard to the **relation between atmospheric temperature and the prevalence of the disease**. He finds that there was a rise in the number of cases corresponding with falling temperature, though this was not absolute.

A. Warner⁵ reports an instance of **smallpox in a fetus**. The mother, a woman of 35 years, had shown the first symptoms of the disease on January 8, and had become practically well by February 12, except for a small abscess of the breast, which was incised. February 14 miscarriage began, and was completed on the 15th, two small fetuses, about 2 months old, being born. Both showed a well-marked eruption, consist-

¹ Deut. med. Woch., 1903, No. 44.

² Zeitsch. f. Hyg. u. Infektionsk.,

⁴ Lancet, Jan. 16, 1904.

Oct. 17, 1903.

, 1903.

ing of circular yellow patches, about $\frac{1}{32}$ of a square inch in size. The eruption was most marked on the back, the head, and the neck. The author thinks that these fetuses might have carried the infection had the woman been discharged previously to her miscarriage. He refers to a case reported by Curschmann, in which apparently the preliminary symptoms of smallpox without a rash appeared in a woman that miscarried. The infant showed an early eruption of smallpox; although the mother had not shown any rash and was well by the tenth day. A somewhat similar case is noted by Warner: The mother was one of a family of 10. The other members of the family had distinct smallpox, but this woman had only the preliminary symptoms. She had not been vaccinated since infancy, although 39 years of age. She was 3 months pregnant and miscarried, the fetus showing no eruption. The mother showed none, either then or subsequently. She was several times unsuccessfully vaccinated soon after this. The author thinks it possible that she had had an abortive attack of smallpox "**modified by the fetus.**"

J. R. Dickson and C. F. Lassalle¹ discuss a disease seen in Trinidad, to which is given the name of **varioid varicella**, basing their conclusions upon the observation of 4029 cases. The general course of the disease corresponds very closely with the conditions seen within recent years in this country in cases of atypic smallpox. The authors think that the chief points in the disease are its atypic character, the occurrence of second attacks in persons who have recently recovered from the disease, the possibility of successful vaccination in persons recently recovered, and the occurrence of attacks in the recently vaccinated. The mortality is extremely low, being only 0.44% in their cases; while smallpox has previously had a very high mortality in the tropics.

In **discussion**, W. B. Clarke stated that the authorities at Barbadoes had had such cases investigated, and that it had been reported to them that the disease is smallpox. The same disease exists in other parts of the West Indies, and is everywhere except in Trinidad called smallpox.

C. J. Aldrich,² discussing the **nervous complications of smallpox**, refers to the literature indicating that it is a rather common cause of mental disorder. Meningitis is rare. Paralysis occurs, he believes, more frequently than in other eruptive fevers, most of the paralytic affections being due to neuritis, and most recovering. He believes that there is occasionally a **disseminated encephalomyelitis**. He has found in literature 15 cases, all of which showed ataxia—slow and awkward movement; a slow, monotonous, explosive speech, with faulty articulation; and some mental disturbance, with a tendency to recovery.

A. R. Ferguson³ has made a study of the **leukocytosis of variola**. There is always an increase in the number of leukocytes, which reaches its highest point at about the ninth day, and is most marked when there is the most pronounced production of pustules. It is characterized by a relative and absolute increase in the small hyaline cells and lymphocytes. It persists for some time after the acute stage of the disease has

¹ Brit. Med. Jour., Sept. 26, 1903. ² Am. Jour. Med. Sci., Feb., 1904.

³ Jour. of Path. and Bact., 1903, p. 411.

passed. In very severe cases, bone-marrow elements—*i. e.*, neutrophile and eosinophile myelocytes, normoblasts, and megaloblasts—may appear in the circulation. These are uncommon in other acute infections.

J. E. Sandilands¹ gives an analysis of the report of the Metropolitan Asylum's Board for 1902, particularly referring to the observations concerning **vaccination and its influence upon the cases of smallpox reported**. He goes into an extensive and complicated analysis of the relation between the character, the number, and the surface-extent of the scars and the protection afforded against smallpox. The chief conclusion reached is that one should denounce the practice of vaccinating with less than 4 insertions. [A conclusion that will not be generally accepted, in this country at least.]

J. T. Neech and J. F. Hodgson² have made a further study of the use of **carbolic acid** in the treatment of smallpox, having given it, altogether, in 136 cases, with a total mortality of 3.6% and, they believe, a favorable influence upon the local lesions. Each day carbolic acid was applied with a camel's-hair brush to the vesicles over a certain area of the body.

J. T. C. Nash³ treated 12 cases of smallpox without **red light**, with the result that there were 4 deaths. He also treated 13 cases with red light, and had only 1 death. In a later series of 5 cases treated with red light, no death occurred. He believes that the red light treatment is valuable.

A. C. Smith⁴ reports a series of 6 cases of smallpox in which he used **antistreptococcic serum**, with, he believes, an excellent influence upon the general condition, and particularly upon the local lesions.

INFLUENZA.

W. Murrell⁵ reports the case of a man of 43 that had a condition in many ways much like acute rheumatism, although there was little or no effusion into the joints. There was no history pointing to the ordinary causes of rheumatism, and the joint-condition was apparently in close relation to influenzal attacks. The case was therefore thought to be one of **influenzal arthritis**, and this condition is briefly discussed.

CEREBROSPINAL MENINGITIS.

T. C. Ely and J. J. Snyder⁶ give a summary of an epidemic of 23 cases of cerebrospinal meningitis that occurred on the U.S.S. Minneapolis. The average age of the patients was between 20 and 21 years. In one case it was determined that the period of incubation had not been more than 7 days. The onset was always abrupt; and the course was rapid, toward death or recovery. Seven patients died. A special point to be noted is that **8 had purulent arthritis**. A number showed acute maniacal

¹ Lancet, Aug. 8, 1903.

² Lancet, Mar. 5, 1904.

³ Lancet, July 18, 1903.

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⁴ Lancet, Dec. 26, 1903.

⁵ Med. Rec., April 2, 1904.

⁶ Amer. Med., Nov. 14, 1904.

delirium with normal temperature. There was a comparative absence of eruption. The authors describe a **peculiar posture that the convalescents assumed when standing**, the neck being drawn back and the chin tilted forward, giving them a "crane-like" appearance. This posture persisted for weeks after the beginning of convalescence. All the patients, when examined during convalescence, showed widely dilated pupils. The authors note the **rarity of cough**, even when there was a severe pulmonary complication. The temperature and pulse were very irregular.

GONOCOCCUS INFECTION.

Silvestrini¹ reports a case of gonorrheal general infection with unusually **numerous complications**, and yet with a favorable outcome. The patient had repeatedly had gonorrhea. The last time, under abortive treatment, it had apparently been rapidly cured; but soon afterward there were symptoms of severe illness with chill. When, shortly after that, the patient was admitted to the hospital, he was stupid and icteric and had swelling of many of the joints. The liver was enlarged and there were a great many hemorrhagic spots over the trunk. The **diagnosis was definitely made by puncture** of both knee-joints and by cultures from a vein. Pure growths of gonococci were obtained from all three. Later, the man showed mitral endocarditis and pericarditis. He was treated with salicylates and general stimulation; and at the end of a month he began to improve, although one knee-joint and one finger-joint remained ankylosed and the other knee was restricted in motion. The author believes that all these complications were due to the gonococcus. He thinks it possible that some joints remained deformed or ankylosed on account of latent tuberculosis, for the patient was of a tuberculous family and had previously had pleurisy.

Von Frendl² reports a case of **gonorrheal endocarditis** that occurred in a man of 20 years. The endocarditis was shown to be due to the gonococcus by microscopic and cultural examination. The striking points about the case were the unusually rapid course of the heart-complication and the **direct metastasis to the endocardium, without the involvement of any other organs**—more particularly, of the joints, which are most commonly involved in such cases.

F. C. Moore³ describes a case that he considers **arterial thrombosis of gonorrheal origin**, the only case of the kind that he can discover. It occurred in a man of 20 who had gonorrhea and was admitted to the hospital with dry gangrene of the left leg. The right leg also soon showed evidences of obstruction of the circulation. The patient died three days after admission, and the autopsy showed the only important lesions to be obstruction of the aorta from the point of origin of the renal arteries down, the clot extending into the left renal artery; and into the common iliac arteries and their main branches, and some of

¹ Riv. crit. di clin. med., 1903, Nos. 25-27.

² Wien. klin. Woch., 1903, No. 27.

³ Lancet, Dec. 19, 1903.

the smaller vessels in the pelvis. The left kidney was almost completely necrotic. Microscopic examination showed a few scattered diplococci, which decolorized by Gram's method. No cultures were made during life or after death. The author found proliferative and degenerative changes in the cells of the intima, with cellular infiltration of the peripheral portions of the thrombus and irregular masses of red thrombus in the more central parts. All this indicates to his mind that the condition was an acute endarteritis with sequential thrombus. He thinks that the most probable cause was an infection of the intima of the common iliac arteries by organisms that had reached the general circulation. [It is unnecessary to state that it was not definitely proved that this was a gonococcal thrombosis.]

STAPHYLOCOCCUS SEPTICEMIA.

O. Niedner¹ reports an interesting case of staphylococcus-sepsis, the main points in the history of the illness being that the patient, a man of 38 years, had had, about 4 weeks previously to his admission to the clinic, a severe fall, which had produced a superficial abrasion on the right arm and on the right hip. He had afterward had some pain about the hip and thigh; and this pain, after two weeks, had greatly increased. Soon afterward he began to have severe general symptoms, which were largely those common in typhoid fever, although the pain about the hip continued. There was tenderness in the gluteal region and in the upper part of the thigh, and the leg could not be straightened. Bacteriologic examination showed no typhoid bacilli and the spleen was not enlarged. Ultimately, cultures showed a **pure growth of staphylococci**, and this result was repeated later. Postmortem examination showed, in the muscle near the right internal condyle, an abscess about the size of an apple; and there was another abscess in the right gluteus maximus. The author refers to the **resemblance that staphylococcus-sepsis frequently bears to typhoid fever**. It usually exhibits a more rapid development of the symptoms and a more marked albuminuria, but these are uncertain signs. The daily variations of temperature are more marked in staphylococcus-sepsis, but this also is often of relatively little clinical importance. It is not surprising that the two are so much alike, because they produce similar pathologic changes. In this case the autopsy showed a large, soft spleen. The liver was enlarged; and the kidneys, enlarged, soft, and cloudy. The mucous membrane of the intestine was soft, thick, and cloudy; and the lymphatic nodules were much enlarged.

Loebl² reported to the Vienna Medical Society a case of severe sepsis that had been treated with **clysms of Credé's silver**, using from 3 to 5 grains in about 2½ ounces of water twice daily, each injection having been preceded by a cleansing enema. He had been led to use this method of administration on account of the difficulty frequently experienced in giving intravenous injections.

¹ Deut. med. Woch., Jan. 21, 1904. ² Wien. klin. W.

YELLOW FEVER.

H. P. Parker, G. E. Beyer, and O. L. Pothier¹ present some experimental evidence in **confirmation of the mosquito-theory of the transmission of yellow fever**; although they had negative results from inoculations with fresh yellow-fever serum that had been passed through a Berkefeld filter. They report at length the description of a protozoan parasite, which they call *Myxococcidium stegomyia*. This they found regularly in mosquitos that had bitten yellow-fever patients. Five forms of it are described: (1) The fusiform, found in the stomach and in the ventral diverticulum; (2) fragmentation bodies, found in an albuminoid mass in the ventral diverticulum; (3) collections of spores, which they term oöcytes, also found in the ventral diverticulum; (4) sporoblasts, which are spherical or ovoid cells found in the diverticulum and in the tissues of the thorax; and (5) spore-like bodies containing objects that resemble sporozoites in the salivary glands. The authors describe the cycle of development of these bodies.

J. Carroll² gives a critical discussion of this report, reaching the conclusion that the fusiform stage of this so-called *Myxococcidium stegomyia* is **not in any way connected with the transmission of yellow fever**; and that the organism appears to be, **not a protozoan parasite, but a yeast fungus**. In its fusiform stage it shows the characteristic budding, staining properties, and vacuolation, or spore-formation, of a blastomycete. It is found with considerable regularity in both male and female mosquitos that have purposely been fed with overripe banana, to which a pure culture of a wild yeast had been added in the laboratory. The organism has not been found in mosquitos of the genus *Stegomyia* that have bitten yellow-fever patients in the early stages of the disease when such insects had been fed only on blood, dried sugar, and water; and this statement applies also to mosquitos that are known to have produced the disease in human beings.

H. R. Carter³ has made a collective investigation concerning the **distribution of *Stegomyia fasciata* in this country**. He also discusses the other factors that affect the conveying of yellow fever. The distribution of *Stegomyia* is general, from 38° N. to 35° S. latitude, on the eastern coast of America. On the western coast it is present at Panama and Guayaquil, and probably from Guayaquil to Acapulco. In the United States it is found all along the coast and the low plains of the Southern States except in Maryland. It is conveyed more rarely by sailing-vessels than by steamers, but may be carried long distances by vessels. It lives a long time—certainly as long as 154 days. It is therefore important to **safeguard the tropical countries of the East**, when direct communication is opened between them and American yellow-fever ports. This species of mosquito propagates particularly in artificial containers of water, but also in pools. The most important method

¹ Report of Working Party No. 1, Yellow Fever Institute. Government Printing Office, Washington, D. C.

² Jour. Am. Med. Assoc., Nov. 28, 1903.

³ Med. Rec., May 14, 1904.

of controlling its growth is to do away with cisterns, water-jars, etc.; and to introduce a water-supply piped to every house. The next most important measure is to use covered drains. The *Stegomyia* hibernates in the United States, but probably large numbers die during this period. It is **essentially a house-mosquito**. It does not feed in the dark or in brilliant sunlight. The cycle of development of the yellow fever parasite before it can be conveyed to man after having infected a mosquito is usually about 14 days. The mosquito is probably conveyed aerially for less than 100 yards, although the direction of the prevailing wind influences this point.

J. B. Tombleson¹ reports a series of observations on yellow fever in which he **obtained a bacillus** in pure culture from the blood. He afterward contracted the disease, and found in his own blood the same organism. He likewise found that a dog infected with this bacillus became ill, but recovered; and its blood reacted with the bacillus in a dilution of 1 : 50. A monkey infected with the bacillus died, after having exhibited black vomit, black bowel-movements, albuminuria, and other appearances of yellow fever. The bacillus was found in the blood of this monkey. Tombleson believes that the reason that this bacillus has not been discovered before is that the methods of staining ordinarily used are not sufficient to demonstrate it. His method was to immerse for one hour in toluidin-blue, decolorize with slightly acid alcohol, and counterstain with eosin. He also notes that he has found the bacillus in a series of other cases of yellow fever. He particularly insists that it is quite readily found in the urine, and in great numbers; and that the examination of the urine for this bacillus is a valuable method of diagnosing yellow fever. He thinks that these facts demonstrate that one important way in which the disease is spread is through infected urine.

Tombleson² states that he has been able to find the bacillus previously described by him in infected mosquitos and their larvas. He states that the best results in staining that he has been able to secure were obtained with a carbol-toluidin-blue prepared after a particular manner, which he describes. [The two papers are, of course, far from convincing.]

PLAGUE.

J. Cantlie³ considers that **attention has been bestowed too closely upon rats** as the carriers of plague, as **probably all domestic animals suffer with the disease**. He thinks that if animals are taken on board ship from a plague-infected port, their temperature should be taken, and all those with fever be weeded out. [This is probably good advice; but it yet remains to be demonstrated that the disease occurs in numerous animals.]

B. Rosalie Slaughter⁴ contributes an interesting discussion of **various**

¹ Lancet, Aug. 29, 1903.

² Lancet, Dec. 26, 1902.

³ Brit. Med. Jour., Sept. 26, 1903.

⁴ Johns Hopkins Hosp. Bull., Nov., 1903.

questions relating to the plague in India, particularly as to the length of time that Haffkine's prophylactic renders a person immune; the length of time before the prophylactic acts; the question whether the prophylactic is dangerous to those that are incubating the disease; the reason that so little has been accomplished in the efforts to exterminate the plague; the question whether inoculation increases the liability to other diseases; and whether the prophylactic is of real value in reducing the plague-mortality. She decides that the prophylactic produces immunity for 3 months, and often longer; that the immunity occurs within 24 hours; that the prophylactic is not harmful in the incubation-period, probably even decreasing the mortality in this stage; and that the reason that the efforts to exterminate the plague have met so little success is chiefly dependent upon the customs of the natives. Inoculation, she believes, has no effect upon other diseases, except possibly a beneficial influence upon eczema.

E. L. Munson¹ discussing the movement of **plague in the Philippines**, states that 970 cases occurred between January 1, 1900, and September 1, 1903, 812 of these having died. The disease was closely restricted to certain quarters, particularly those in which there was a large Chinese population; being seen 12 times as frequently among Chinese as among Filipinos, and less frequently in Americans than in Filipinos.

W. Dönitz² reports the case of Dr. Sachs, who died of plague as the result of an infection acquired in the Institute for Infectious Diseases at Berlin. He had been working with plague. His illness began with sore-throat and the signs of a very slight local pneumonia, but with evidences of severe general infection. This led the attendant to suspect plague. The patient was at once isolated, and plague bacilli were found in his sputum. He died within less than three days of the beginning of his illness. The infection may have occurred through a scratch on the finger, or through the respiratory apparatus direct. He had wounded his finger slightly while at work on plague bacilli. An attendant also acquired the disease. He, too, was at once isolated; and, **though he had plague bacilli in the sputum, he recovered rapidly**, his recovery having been attributed to the use of plague-serum, 185 cc. of which was used in all. The author refers to the great importance of isolating these cases and of establishing the diagnosis early by bacteriologic methods.

CHOLERA.

W. Kolbe and E. Gotschlich³ report, in association with H. Hetsch, O. Lentz, and R. Otto, their investigations concerning the **bacteriologic diagnosis** of cholera and the specificity of the cholera vibrio. Their studies were carried out in India during the recent cholera-epidemic. They have determined that **cholera-like vibrios occur much more frequently in human stools** than has previously been suspected. This

¹ Med. Rec., Jan. 30, 1904.

² Berl. klin. Woch., July 6, 1903.

³ Deut. med. Woch., July 23, 1903.

is a ready source of error in the ordinary bacteriologic methods of diagnosing cholera. These investigators have made more than 1000 observations of agglutination, and have determined that this is an extremely valuable and specific method of determining whether specific cholera vibrios are present. The organisms, in a peptone-water culture, were tested for agglutination with the cholera-serum. They state that the group reaction did not occur. Of 73 cases investigated during the epidemic, 59 showed the presence of true Koch's cholera vibrios, 2 of these showing a round cholera-like vibrio that was not the true cholera vibrio. Fourteen other cases showed vibrios that were distinctly different from the cholera vibrio. The cholera-like vibrios were never found in 2 or 3 members of the same family. For this and for other reasons they consider that these **cholera-like organisms were merely accidental and had no pathogenic importance**, especially in relation with the symptoms of cholera. They positively state that they could not find any evidence that several organisms cause cholera. They insist upon the **great importance of agglutination in the diagnosis** of that disease. They make peptone-water cultures for 8 hours, and then transfer them to agar-preparations in plates for 8 hours. They next carry out the agglutination-test in the hanging drop with an active cholera-serum. They make the agglutination in a dilution of 1:1000. If this does not react, they make the test in various dilutions, from 1:50 to 1:2000, always diluting with 0.8 % sodium-chlorid solution. A control-test is always carried out with normal serum. The most important point is to secure a high potency cholera-serum that may be kept and is prepared from pure cultures. Such a serum is given out by the Berlin Institute for Infectious Diseases.

R. P. Strong¹ contributes a brief report concerning a **new method of producing cholera vaccine**. It was found that the **autolytic digestion of killed spirillums** in aqueous solution is followed by the setting free of many cholera receptors. The filtrate from this fluid was therefore used for protective inoculation. In producing this vaccine, the author sprays the surface of large, flat-sided flasks, filled with agar, with twenty-hours' bouillon cultures. The flasks are then kept in the incubator, at 37° C., for 20 hours. The growth is then emulsified with sterile water, removed from the surface of the agar, placed in a sterile flask, and kept at 60° C. for 24 hours. It is then placed in the incubator for from 2 to 5 days, the latter period being apparently the best to accomplish satisfactory autolysis. It is then filtered through a Reichel filter, and the fluid thus obtained is examined for sterility and carefully standardized. Experiments on animals have shown that the injection of this fluid **produces marked bactericidal and agglutinative properties**. It causes no local reaction, while the material that remains behind on the filter causes an extremely intense local reaction. The filtrate protects guineapigs perfectly and regularly against infection with cholera spirillums.

¹ Amer. Med., Aug. 15, 1903.

BERIBERI.

D. H. Currie¹ states that beriberi, or a disease closely resembling it, is frequently met in Chinese fishermen returning to San Francisco from Alaska. The voyage is long, and the Chinese are kept aboard ship under extremely bad hygienic conditions; and, while at the canneries, they are also under unfavorable conditions of diet and general hygiene, the water also being bad. Epidemic dropsy has frequently been observed among these men. During the year past a number of cases showing motor symptoms were observed. Currie thinks that at least 4 % of the men engaged in this work develop this condition.

A. Stanley² has made a study of sudden death in beriberi and diphtheria in 341 cases of the former and 500 of the latter. Of the cases of diphtheria, 446 showed lowered pulse-tension, and 30 patients died of heart-failure. Of the beriberi cases, pulse-tension was lowered in 254, and 31 patients died of heart-failure. Dilation of the heart was observed in 98 of the beriberi cases. Stanley particularly notes that heart-failure may occur before there is any manifestation of disturbed innervation. From his own clinical observations, and from the studies of various authors on the postmortem conditions, Stanley decides that the cause of heart-failure in these cases is not neuritis of the vagus, but **degeneration of the heart-muscle itself**. Sudden heart-failure does not necessarily indicate a suddenly developing lesion, but is due to a gradually increasing heart-weakness from muscle-degeneration, the fatal issue being brought on by some sudden, especially severe, strain.

H. E. Dunbar³ has made a study of the urine in beriberi, reaching the conclusion that **metabolism in this disease is seriously diminished**, the amounts of urea, phosphoric acid, and sulfuric acid being greatly reduced. He thinks it possible that some of the organs active in metabolism, particularly the liver, are seriously disturbed in their functions; and this, he thinks, is in accordance with the fact that patients are likely to complain of illness before the onset of marked symptoms referable to the peripheral nerves. The purin-bodies show no change of interest, nor do the conjugate sulfates or the neutral sulfur.

MALTA FEVER.

C. F. Mason⁴ reports a case of Malta fever in Texas, the first observed in that State. About a dozen cases of the disease have been seen in the United States, all of them imported. This patient was a soldier and had been in Cuba and the Philippines. He had a history of having been continually on sick-report between June, 1899, and June, 1900; and he probably had Malta fever at that time. He was then well until September, 1902, when he was taken sick with what was thought to be malarial fever and malarial cachexia complicated with

¹ Amer. Med., Aug. 8, 1903.

² Brit. Med. Jour., Dec. 26, 1903.

³ Brit. Med. Jour., Feb. 27, 1904.

⁴ N. Y. Med. Jour., Aug. 8, 1903.

chronic muscular rheumatism. When seen by Mason, malaria was excluded, as well as typhoid and paratyphoid fever. The blood reacted with *Micrococcus melitensis*, and the patient had the usual course of Malta fever. The history of the case is interesting because it demonstrates the usual errors in diagnosis.

P. W. Bassett-Smith,¹ in discussing the **duration of Mediterranean fever**, states that 3 months is usually the minimum duration; although sometimes, near the Mediterranean, the disease may be over in 1 or 2 months. Commonly, it lasts longer than 3 months. The patients often exhibit slight attacks of fever and rheumatic pains, with occasional intervals, for years; and such patients are usually invalided out of the military service with severe and pronounced cachexia. He has seen almost continuous fever for 2 years, and irregular fever for as long as 3 years. In the latter cases the blood still reacts to *Micrococcus melitensis* at a dilution of more than 1:40. He refers to the experimental work carried out by himself and others, which has shown that the micrococcus is often present in the blood of these patients as late as the one hundred and forty-second day. This, he thinks, **explains the prolonged course of the disease**; as the causative agent actually remains present in the body throughout this time. He believes that the only treatment that may be expected to have a satisfactory influence upon the disease will be with a specific antiserum.

P. Manson² describes a case of recurring fever in a person who had lived at Gibraltar. The fever was considered to be malarial or possibly Malta fever. Examination of the blood, however, showed no evidence of either disease, but showed a spirillum somewhat resembling that of relapsing fever, presenting, however, certain probably characteristic differences. Manson thinks it quite possible that cases called Malta fever are somewhat heterogeneous in character, and that careful observation should be made to demonstrate whether this is true and whether this spirillum has any pathogenetic importance.

LEPROSY.

W. D. Neish and T. J. Tonkin³ present an article on **leprosy in Jamaica**. They state some interesting facts, among which is that leprosy is **decidedly decreasing there**, the number of cases having been reduced by about two-thirds within the last thirty or forty years. This decrease Neish and Tonkin consider to be **due largely to the influence of the leper home**. They especially refer to the fact that the diet of the native Jamaican, like that of people in many parts of the world where leprosy is common, is very deficient in nitrogenous elements. This, they think, is probably important in relation to the occurrence of the disease. They believe that **to provide a proper diet is of the utmost importance in the treatment** of leprosy, and has more influence than has any other factor. They have had excellent results from treating

¹ Brit. Med. Jour., Sept. 19, 1903. ² Brit.

³ Bristol Medico-Chirurgical Journal, Ma

rch 5, 1904.

the disease with **intramuscular injections of mercury perchlorid**; but they especially insist upon care of the general condition, particularly improving the diet. They believe that by using such measures, treatment could not infrequently be made successful in curing the disease. They refer in detail to one case of advanced and apparently incurable leprosy that was entirely arrested, the patient being ultimately quite cured.

J. Daland¹ discusses the observations that he has made concerning leprosy in the Hawaiian Islands. He thinks that the disease is feebly contagious, and that the Hawaiians are peculiarly susceptible to it; while Caucasians seem to possess a high degree of immunity. He states that syphilis predisposes to leprosy, and that heredity seems to be of little importance. Segregation has prevented the spread of the disease.

J. Hutchinson,² in opening a discussion on leprosy, took a positive stand against the view that the disease is contagious, and offered a series of facts to indicate that it is **in some way due to the consumption of fish**. Referring to the frequency with which it is seen in fish-producing districts, he stated that when religious creed stimulates the consumption of fish, leprosy increases; that countries in which fishing is largely carried on suffer exceptionally from the disease; and that it may start in a country when the fishing industry is developed. He believes that this theory explains many facts concerning the disease that cannot be explained by any other hypothesis. He thinks that it is unfair to isolate cases of leprosy.

F. M. Sandwith mentioned a case of leprosy in a boy who had never eaten fish. P. S. Abraham took issue with Hutchinson, and read a strong letter from Ehlers, who insisted that the only truth in the fish-hypothesis is that persons who eat badly cured fish are very poor and very dirty. J. Cantlie mentioned a case indicating the contagiousness of leprosy. J. D. Hillis reported extremely favorable effects from the isolation of cases of leprosy, and insisted that this is an essential procedure.

TYPHUS FEVER.

F. M. Sandwith³ contributes an interesting discussion of **typhus in Egypt**, referring briefly to the history of the disease in that country and to its distribution. He notes the great importance of the season in producing the disease, 38 out of 40 cases in 1901, for example, having been admitted to the infectious hospital between March and August; while in the other 6 months only 2 cases were seen. Of the 151 cases that Sandwith has seen in his wards, **all occurred between February and October**. The outbreak of typhus in the spring is always preceded by some months of overcrowding and ill ventilation. The chief known factors in the production of epidemics of the disease are overcrowding, deficient ventilation, uncleanness, faulty conservancy arrangements, and insufficient diet for the work required. The disease is undoubtedly

¹ Jour. Am. Med. Assoc., Nov. 7, 1903.

² Brit. Med. Jour., Sept. 26, 1903.

³ Practitioner, Apr., 1904.

contagious; but less so than are such infections as influenza, dengue, and measles. Sandwith has noted its occurrence in doctors, orderlies, etc. The most common variety of the disease was the adynamic. In the better class of persons the nervous type, with marked cerebral symptoms, is common. Sandwith has sometimes noted the eruption as early as the third day; but it is more common on the fifth or sixth day. If, in a light-colored person, it cannot be found by the end of the seventh day, he considers that the diagnosis of typhus cannot be maintained. The signs of the disease upon which he particularly relies in patients whose skin is such that an eruption cannot be noted when it is present are fever, epistaxis, injected conjunctivas, slightly contracted pupils, dry tongue, a slight musty odor from the mouth, a feeble first heart-sound, and a general air of prostration. The rash often becomes more marked after death. If a patient lives until the fifteenth day, he is not likely to die, unless it be of a complication. Sandwith notes that the sweat sometimes leaves a white crystalline efflorescence upon the eyelids and face. Deafness is common and is an early symptom. A striking appearance is the marked stupor that comes on early. **The smell is characteristic.** Hypostatic congestion is so common as to constitute an important symptom in diagnosis. Sandwith has never seen a true relapse. Buboës are common; jaundice is rare. The disease is rarely combined with other diseases except relapsing fever. In doubtful fatal cases the scantiness of the blood in the cadaver, its dark color, and the absence of clot-formation are important diagnostic points. The diseases that are likely to be mistaken for it are typhoid fever, measles, pernicious malaria, pneumonia, relapsing fever, and plague. All but the last three are quite easily distinguished by proper methods. In plague, the bubo is usually in the inguinal or femoral region; in typhus, in the parotid. In the latter disease it does not occur until the second week; in the former, it is one of the first symptoms. The plague-bacillus also helps to settle the diagnosis. Under the age of 20 years, Sandwith states, only 10% die. **After 40 years of age, the prognosis is always bad.** In treatment, he refers particularly to the very great importance of unlimited fresh air.

RABIES.

Schüder,¹ in discussing the importance of Negri's protozoa in the production of rabies, mentions, first, the size of these organisms, as described by Negri, and states that he has found that a filter that allows of the passage of the cause of rabies through it does not, at the same time, allow of the passage of the cholera vibrio; hence, the organism causing rabies must be smaller than the cholera vibrio. This fact it is impossible to harmonize with the description of his organisms given by Negri.

¹ Deut. med. Woch., Sept. 24, 1903.

MALARIA.

Etiology and Symptomatology.—C. Christy¹ discusses the **mode of entry of the spore into the red corpuscle** in malaria, describing some observations that he has recently made. These indicate that the following occurs in the somewhat unknown gap between the rupture of the sporocytes and the entrance of the amebulas into the red corpuscles: The spore remains free for only an extremely brief period, almost instantly attaching itself to the rim of the red corpuscle. It then, by means of an elongation of the cytoplasm, spreads itself over about one-fifth of the circumference of the red corpuscle. It next seems to sink somewhat into the corpuscle; and pseudopods, or minute processes, are thrown into it—chiefly from the extremity of the parasite. The nucleus and the nucleolus gradually follow, until the whole parasite is well within the corpuscle, leaving no evident gap or fault in the circumference of the corpuscle. The extremities of the young amebula then stretch out and unite, forming the ring. **This method of entry does not correspond with that described by Schaudinn,** which is one of forcible entry.

O. Lerch² reports a case of malaria that was followed by **interstitial nephritis and peripheral neuritis**. Leukocytosis occurred during the malaria, and this Lerch considers to have been due to the complications.

W. Shropshire,³ in discussing **hemoglobinuric fever**, analyzes the **conditions in 202 cases**, 29 of which were his own, notes of the others having been obtained from other practitioners. Malaria was always present, and the hemoglobinuria nearly always came on at the proper time for an exacerbation of the malaria. In 15 % of the cases there was no relation to quinin. In 89 of 108 cases treated with an increased dosage of quinin, the hemoglobinuria is said to have disappeared. Shropshire believes that inadequate dosage with quinin is the cause of error in the conception of the condition, and thinks that the drug should be pushed.

In discussion, H. L. Sutherland stated that in treating hemoglobinuria, if the temperature continues high after 24 hours or tends to go higher, he gives quinin. J. B. McElroy thought that in intermittent hemoglobinuria quinin may sometimes be used cautiously with benefit; but that in continuous hemoglobinuria, the drug should not be employed. The parasites are not usually present, and quinin tends to make the condition worse. W. Krauss stated that to study a condition like this by proxy is exceedingly unsatisfactory. [A view with which we agree.]

A. Lubbert,⁴ in discussing tropical hemoglobinuria, **divides the cases into three groups**, one being largely due to climatic influence upon patients with disordered liver. These persons are usually recent settlers with no previous history of malaria and no immediate evidence of that disease. They show enlargement and tenderness of the liver, with

¹ Brit. Med. Jour., Sept. 19, 1903.

² Amer. Med., Jan. 16, 1904.

³ Jour. Am. Med. Assoc., Sept. 5, 1903.

⁴ Arch. f. Schiffs- u. Tropen-Hyg., Oct., 1903.

slight jaundice. Such patients sometimes develop abscess of the liver, and may develop parenchymatous nephritis. In the second group of cases there is malaria, with marked evidences of liver-disorder. In the third, the hemoglobinuria is, the author thinks, caused by quinin-poisoning in persons whose livers are abnormal. He particularly insists upon the importance of the liver, and believes that it is usually found to be disordered in cases in which hemoglobinuria occurs. [A belief that is not well supported by facts.]

Prophylaxis.—A. Laveran,¹ discussing the **prophylaxis of malaria in Madagascar**, especially in the army, refers to the satisfactory use of preventive doses of quinin elsewhere; and also to the employment of mosquito-destruction, mosquito-nets in the houses, etc. *Anopheles* have been found in the island in large number. The author particularly refers to the importance of protecting those soldiers who, in the course of their duty, are necessarily exposed frequently at night, when the danger is especially great—a **point of much importance in army-hygiene**.

H. M. Fernando² reports some observations that he has made of tropical malaria in Ceylon and the prophylaxis of the disease. In two zones that he describes—one moist and the other dry—the peculiarities of rainfall seem to affect the time of the occurrence of malaria decidedly. The estivoautumnal is the most common form of the disease, quartan being almost unknown as a local infection, and benign tertian being extremely rare. The author thinks that the tropical parasite requires 48 hours to mature in human blood. He believes, also, that the chances of infecting mosquitos with the tropical malaria are much less than with the benign form of the disease. The extermination of *Anopheles* is not practicable in Ceylon, because rice-growing is the chief industry of the country; and mosquito-proof houses are impracticable in the tropics, in Fernando's opinion. He thinks that the **best measure is a modification of Koch's quinin prophylaxis**, treating only cases of malarial fever as they occur; but seeing that these cases are treated promptly, energetically, and systematically. Such measures have been adopted in a limited district, all ill persons being searched for, examined, and, when suffering with malaria, treated with quinin. The administration of the drug is continued for a month after the fever is over. The result of this has been that the plantation on which it has been carried out has shown a **remarkable decrease of the fever**.

J. W. W. Stephens,³ in a discussion of the report of S. P. James concerning the antimalarial operations at Mian Mir, refers to a series of details, the most important of which is that a comparison of the endemic index of malaria in 1901 with that in 1902 showed a slight reduction when no measures of control had been carried out, a **noteworthy reduction when the larvas had been destroyed**, and a **reduction from 56.5 to 4 when cases had been segregated**. In the region treated with the prophylactic administration of quinin the endem

¹ Bull de l'Acad. de Méd., March 8, 1904.

² Brit. Med. Jour., Sept. 26, 1903.

³ Lancet, N

October, 1901, had been 20, and in 1902 the disease had entirely disappeared in this region. [A sufficiently striking proof of the great importance of energetic measures directed against malaria.]

H. L. Chase¹ discusses the efforts that have been made in Brookline, Massachusetts, to **abate the mosquito nuisance**. He describes the details of the destruction of the breeding-places, when possible; the use of oil, etc. He states that, as a result, while the number of reported cases of malaria in 1897 was at least 50, in 1902 there were but 12 cases reported; and the mosquito nuisance had been greatly reduced—at a total cost of only about \$625.

Treatment.—T. S. Dabney² refers to 2 cases in which quinin sulfate **produced profound toxic effects** in the patient, while the hydrochlorate did not; and another case in which either salt produced very severe toxic symptoms.

A. D. E. Kennard³ recommends the use of a combination of **salicylic acid and quinin** in the treatment of malarial fever, and considers that good results may be obtained from sodium salicylate when the patients are not able to take quinin.

SPOTTED FEVER OF THE ROCKY MOUNTAINS.

J. F. Anderson⁴ discusses a series of investigations that he has made concerning the spotted fever of the Rocky Mountains. Because this disease is probably carried by ticks, he suggests that it be called "tick fever." [A suggestion of doubtful utility, because the name is already used for an African fever.] He has found the parasite described by Wilson and Chowning. It was most satisfactorily stained with Wright's stain, followed by Loeffler's blue. The **parasites were easily found**, and persisted for some time after the recovery of the patient. Bacterial cultures were utterly negative, or showed a variety of organisms in different cases. The time of the appearance of the disease corresponds with that of the appearance of the ticks; and after the disappearance of the ticks the disease disappears. There is always a history of tick-bites a few days before the disease develops. The narrow limitations of the disease are due, the author believes, to the fact that the tick is unable to travel by itself for any great distance; but the fact that he has shown that the parasites may remain in the blood for 24 days, at least, after recovery, shows the opportunity that may be provided for transferring the infection. The tick found in that region was considered by Stiles to be *Dermacentor reticulatus*. In discussing the symptomatology, Anderson notes a slight **leukocytosis and a marked increase in the large mononuclears**. The mortality varies greatly, sometimes reaching 90 %, and having averaged about 70 % in the Bitter Root Valley. In other regions the disease is much less fatal, only about 2 % dying. The **diagnosis is comparatively easy** in the region in which

¹ Boston M. and S. Jour., July 30, 1903.

² New Orleans Med. and Surg. Jour., Oct., 1903, p. 253.

³ Lancet, July 11, 1903.

⁴ Amer. Med., Sept. 26, 1903.

the disease is known to occur. It depends upon muscular soreness, constipation, and an eruption on the third day of illness, at first macular and later petechial, which appears first on the wrists and ankles. The disease resembles cerebrospinal meningitis, peliosis rheumatica, typhoid fever, and particularly typhus fever. In prophylaxis, the author recommends that as soon as a person is bitten by a tick the insect should be removed and the place cauterized with 95 % carbolic acid. The removal of the insect may be facilitated by applying ammonia, turpentine, kerosene, or carbolized vaselin.

TRICHINOSIS.

K. Schleip¹ contributes an extensive discussion of an **epidemic of trichinosis** in which there were 30 severe, and a considerable number of mild, cases; but no deaths. Sixty patients were studied in considerable detail. The **period of incubation** in these cases varied from 3 to 15 days; in 6 cases it was between 3 and 6 days. Schleip particularly insists upon the occurrence of enlargement of the spleen in most of the cases, contrary to the general teaching. He found a **mild leukocytosis** present in these cases. **Of 64 persons examined, 62 showed eosinophilia.** The other 2 cases were of very doubtful nature. The eosinophilia, however, was not always in direct proportion to the severity of the case. It is **sometimes quite slight; i. e., less than 5 %.** He was not able to examine the cases early enough to determine whether or not eosinophilia is a symptom that occurs early. He considers it, however, a very important diagnostic symptom. He notes that in convalescence the lymphocytosis increases, and that there is a flooding of the blood with blood-plates. There is some reason to believe that the blood-plates are derived from the eosinophile-granules. He thinks that the presence of a large number of eosinophiles in the muscles is an evidence merely of the fact that the specific irritation here is greater than in other regions, and that it has nothing to do with the formation of eosinophiles; eosinophilia being the result of the helminthiasis, and not of the myositis.

F. R. Gould² discusses the value of **eosinophilia in the diagnosis of trichinosis** and reports a case. He discusses the 6 cases that have been reported, in which there was no increase in the number of eosinophiles, and particularly refers to the fact that in 4 cases a long period of time had elapsed between the beginning of the symptoms and the observation of the blood. In another, the trichinas found were encapsulated; and in the remaining cases they were partly calcified. Gould thinks, therefore, that in the negative cases **earlier examination might have revealed an eosinophilia.**

¹ Deut. Arch. f. klin. Med., Bd. lxxx, Hefte 1 u. 2.

² Amer. Med., Sept. 26, 1903.

TRYPANOSOMIASIS AND SLEEPING-SICKNESS.

P. Manson,¹ in opening a discussion on trypanosomiasis, noted that these parasites are often present in but very small number in the peripheral blood; and that, therefore, a **careful search becomes necessary in order to find them**. He believes that this is most satisfactorily undertaken when the body temperature is high, and may be assisted by removing the hemoglobin from thick films. This is accomplished by dipping the films in water for a short time, or by using Ross's recently described method for malaria. Centrifugating the blood may also be very useful. Animal-inoculations have, so far, been unsatisfactory as a means of diagnosis. As to the **clinical features**, fever seems to be a symptom; but this is not yet certain. In Europeans, so far as observed, there is always irregular, undulant fever. The initial rise of temperature is likely to be high. A frequent symptom is also a circinate eruption. Muscular weakness, rapid pulse, anemia, and breathlessness are common. The spleen is sometimes enlarged, and sometimes not. Eye-symptoms are common, and probably important in diagnosis. Other curious symptoms occur, such as temporary paralysis and choreic attacks. One patient had thrombosis. It is quite possible that mononuclear leukocytosis is almost regularly present. Its presence is a feature common to several types of protozoan infection. Manson thinks that the future will show that **both the trypanosome and the malarial parasite have other animal hosts besides the human**. He expresses in this paper decided skepticism concerning the relation between infection with trypanosomes and sleeping-sickness, mentioning a number of reasons for doubting the etiologic relation. The prognosis of trypanosomiasis seems to be good in the native, but not so favorable in the European—although not necessarily bad. He thinks that some immunity is gradually being acquired. Treatment has, so far, been entirely unsuccessful.

C. Christy referred to his observations concerning the distribution of sleeping-sickness and its connection with filariasis and with trypanosomiasis. He especially noted that almost all the cases of sleeping-sickness had occurred near the water's edge in one region that had been particularly investigated, and that **compact villages and populous centers are much less seriously affected than are plantations and outlying places**. This is of interest in relation to the fact that the tsetse-fly inhabits just such places. It is not yet known whether the area of distribution of this fly agrees with that of sleeping-sickness, but it is known that the fly avoids the neighborhood of villages and of populous centers. Christy said that inordinate appetite is a conspicuous symptom of sleeping-sickness and also of trypanosomiasis in horses.

J. F. Dutton and H. Todd reported some observations concerning trypanosomiasis in West Africa, and stated that they had seen altogether 6 cases in natives and 1 case in a white man. They think that, con-

¹ Brit. Med. Jour., Sept. 19, 1903.

sidering the difficulties in studying the disease in that region, it is much more common than the figures indicate. The white man died, after having had a severe cold and fever, but the cause of death was not known. Enlargement of the lymphatic glands was present in some of the cases seen. Parasites were numerous in one case, but scanty in the others. As a rule, the disease is apparently very mild in the natives. Dutton and Todd think that there **can be no acquired immunity**, because of the ages of the natives affected. They then referred to a series of observations concerning the possibility of infecting various animals. In spite of many attempts to determine the transmitter of the disease by trying to infect healthy animals through flies that had bitten infected animals, they did not succeed. They think it possible, however, that the parasite cannot live for even a few hours in the insect's proboscis during the dry season; as ponies passing through a certain portion of the bush in the wet season often become ill and die of "fly-disease," while during the dry season they usually escape.

A. Castellani stated that, because the trypanosome has almost always been found in the cerebrospinal fluid of patients with sleeping-sickness, and not in other cases, and because the pathologic changes of sleeping-sickness are more in favor of than against its being a protozoan infection, he considers the disease to be almost certainly due to trypanosomiasis.

L. W. Sambon noted that trypanosomes are very common in fish, and that some of the natives attribute sleeping-sickness to the sting of a fish or to the consumption of certain diseased fish.

A summary of the report presented by D. Bruce, A. Nabarro, and Greig, the Sleeping-sickness Commission of the Royal Society,¹ shows that the observations made by the Commission **speak strongly for the trypanosome theory** of the origin of the disease. After reviewing the previous observations, they note that in a large series made by a number of men trypanosomes were found in almost all the cases. These parasites also occur in the cerebrospinal fluid in cases of sleeping-sickness in districts other than Uganda, and they were found in diseases other than sleeping-sickness in the cerebrospinal fluid. They were found in the peripheral blood of all cases of sleeping-sickness. The commissioners believe that trypanosome fever bears a close relation to sleeping-sickness. They made a study of the blood of the general population, in order to determine whether trypanosomes were present. These were found in over 28 % in the sleeping-sickness areas, but not in a single instance in areas in which sleeping-sickness does not occur. The trypanosome of sleeping-sickness and that of trypanosome fever seem to be identical microscopically. The Commission made a very interesting series of studies of the effects of the injection of these trypanosomes into animals, and **produced in monkeys symptoms strikingly analogous to those of sleeping-sickness**. They could not determine that they were dealing with more than one species, and present some extremely interesting observations of the distribution of *Glossina palpalis*, a species of tsetse fly.

¹ Brit. Med. Jour., Nov. 21

of sleeping-sickness. They also made experiments in the infection of monkeys through these flies, after having allowed the insects to feed upon patients with sleeping-sickness. They decide that the flies can convey trypanosoma to healthy monkeys up to at least 48 hours after feeding. On account of the wide distribution of trypanosome infection, there is evident opportunity for the transmission of the disease through these flies.

P. Manson¹ records the interesting fact, in relation to his previously described case of trypanosomiasis, that after the patient had left the hospital she developed drowsiness, which became more pronounced; and that she died in November, 1903, 2 years and 3 months after the supposed date of infection, having presented pronounced symptoms of sleeping-sickness. The autopsy and histologic examination showed **unequivocal evidences of sleeping-sickness**. This is the first well-authenticated case of that disease in a European; and, furthermore, Manson now believes it to be almost **conclusive evidence that the trypanosome is at least an important factor** in the etiology of this disease. This patient had been bitten by what was probably a tsetse-fly in August, 1901. A fortnight later she began to have a series of recurrent attacks of fever, with enlargement of the liver and spleen, erythematous eruption, and phlebitis, the condition being diagnosed trypanosomiasis in October, 1902.

L. Sambon,² in discussing sleeping-sickness, **criticizes the experiments of the Commission** concerning the transmission of the disease to monkeys by means of tsetse-flies, and insists that the monkeys were not protected against other sources of infection. He also refers to the fact that monkeys bitten by flies that had previously bitten sleeping-sickness patients did not develop symptoms of the disease until after these had appeared in monkeys bitten by flies that had not fed on patients with sleeping-sickness. **He does not believe that the experiments show that the flies convey the trypanosomes from the patients** on whom they have fed, nor that the Commission has shown that the flies in this region carry the specific trypanosomes of sleeping-sickness. He discusses the circumstances in which tsetse-flies are found, and states that these are, chiefly, the presence of water, a thickly wooded district, and a loose, fragmentary soil. The presence of the insects is apparently not connected with that of big game, but Sambon thinks that it is connected with their habit of feeding on fishes. He believes that it will be comparatively easy to eradicate the glossinæ.

Nabarro, in referring to the results of the Commission, stated that in sleeping-sickness the presence of the trypanosomes in the lumbar fluid is not due to leakage of blood. He mentioned the fact that Wiggins had found the disease and the trypanosome in the neighborhood of Lake Victoria Nyanza. Nabarro himself has found sleeping-sickness and trypanosomes in a Persian. In the monkeys experimented upon by inoculating trypanosomes, the symptoms appeared after a few weeks; but within about a month after this they began to disappear. At the

¹ Brit. Med. Jour., Dec. 5, 1903.

² Lancet, Jan. 23, 1904, p. 228.

time that Nabarro left Africa nearly all the monkeys were well, 1 having died of tuberculosis, and 3 of possible sleeping-sickness. He believes that certain of the Commission's observations indicate that the trypanosomes from the blood and from the cerebrospinal fluid in human beings are identical. In reply to the criticism of Sambon concerning the infection-experiments with the fly, Nabarro stated that the differences in the results mentioned were due, in his opinion, chiefly to the fact that flies that had not fed on sleeping-sickness patients had not had food at all, and therefore fed much more freely than did the others. For this reason they infected the monkeys more readily. He did find trypanosomes in other animals than monkeys, but these trypanosomes were different. He had never seen a trypanosome in a healthy monkey straight from the fields.

F. W. Motta discussed the lesions found in sleeping-sickness, and especially referred to the occurrence of **universally enlarged lymphatic glands**. He also referred especially to the presence of streptococci in most cases; as he believes that this infection accounts for the lymphatic-gland enlargement and for the cerebral lesions observed. He had never found trypanosomes in sections from the subarachnoid spaces or in the bloodvessels of the central nervous system, but had found them in a rabbit dying of surra. He does not believe that the streptococcus was merely an accidental infection from bedsores and the like.

C. F. Harford referred to sporadic cases of sleeping-sickness on the upper Niger. He particularly noted the fact that American negroes do not develop this disease.

Nabarro, in considering the importance of the disease, referred to the fact that **50,000 persons died of it last year** on the shores of Lake Victoria Nyanza and in Usoga.

Manson believes it possible that the disease exists in many regions in which it has not been recognized, and considers that sporadic cases undoubtedly occur.

J. E. Dutton, J. L. Todd, and C. Christy,¹ in a study of human trypanosomiasis on the Congo, representing the Liverpool School of Tropical Medicine, have **investigated a large series of persons with and without sleeping-sickness**. They found trypanosomes in many instances of both classes of cases. They could find no distinguishing features between the trypanosomes in sleeping-sickness and those found when sleeping-sickness was absent. They saw no difference between the organisms obtained from rats that had been inoculated from cases of sleeping-sickness and those obtained from rats inoculated from cases of simple trypanosomiasis. They have found no reason to believe that any of the trypanosomes that they have observed on the Congo are other than *Trypanosoma gambiense*.

E. D. W. Greig and A. C. H. Gray,² in a brief note concerning the **lymphatic glands in sleeping-sickness and in trypanosomiasis**, state that they have regularly found trypanosomes in the fluid with-

¹ Brit. Med. Jour., Jan. 23, 1904.

² Brit. Med. Jour., May 28, 1904.

drawn from the glands in both conditions, the glands having been punctured with a hypodermic syringe. They believe this to be further proof of the identity of the two diseases, and also of the etiologic relation of the trypanosomes to sleeping-sickness.

LEISHMAN-DONOVAN DISEASE.

Leishman¹ and Donovan² describe bodies found in patients who lived in Calcutta or Madras or had been in these cities recently. Leishman's patients suffered with low fever, chronic dysentery, and cachexia; Donovan's were said to have died of chronic malaria. The bodies described by both authors were apparently the same. Leishman believes them to have been altered trypanosomes; Donovan believes that they were not. R. Ross³ has examined the bodies found in Donovan's cases, and believes that they are not trypanosomes; he considers them to be **probably some new organism**, and thinks that the fever-charts in these cases resemble those of kala-azar.

P. Manson and G. C. Lowe⁴ describe a case in a man from Darjeeling, in which there was **persistent fever with splenic enlargement**, without any evidence of malaria or other cause; and in which splenic puncture showed **Leishman-Donovan bodies** in large number. The appearance of these parasites is given in considerable detail. Manson and Lowe think that this **new parasite is probably of importance in tropical pathology**. They believe that, once in the spleen, it multiplies by simple division. They could find no evidence of its presence in the peripheral blood, except in one doubtful specimen. By tapping the liver, they found many single or double parasites, but none of the zooglea masses that were readily found in the lung. They thought, therefore, that the parasite might escape from the body through the biliary tracts; but they could not find it in the feces, and neither was it present in the urine. The patient's blood showed 13 % of large mononuclear leukocytes and 44 % of lymphocytes; the eosinophiles were 2 %. The tropical cases of splenic enlargement with fever, but without malaria, they divide into 2 classes: one showing recurrent attacks of high fever, followed by a definite cachexia, and death within a few months; and the other showing milder fever and milder cachexia. The latter may live for a long time, and usually die of some other affection. Malarial parasites are, of course, entirely absent in both these instances. Not infrequently there is a more or less marked pigmentation of the skin.

C. Donovan⁵ briefly states that Laveran and Mesnil have determined that the body previously described by Donovan as having been found in the blood of the spleen in a case belongs to a **new species of piroplasma**. In all, the author has now found these parasites in 16 cases in his own wards. They were obtained in each case by puncturing the spleen and liver during life. The disease in which they are found is as-

¹ Brit. Med. Jour., May 30, 1903.

² Ibid., July 11, 1903.

³ Ibid., Nov. 14, 1903.

⁴ Brit. Med. Jour., Jan. 23, 1904.

⁵ Lancet, Nov. 14, 1903.

sociated with enlargement of the spleen and liver, irregular fever, paroxysmal edema of the feet, pulmonary congestion, occasional subcutaneous hemorrhage, and cancrum oris. Medication has been ineffectual.

FILARIASIS.

H. C. Bastian,¹ in discussing the probable cause of infection by *Filaria perstans*, refers to the observations of Christy with regard to the **relation between the banana** and filariasis. He mentions his own observations, which demonstrate the frequency with which bananas are infested with nematodes. He also gives his reasons for thinking that the embryos found in the blood of human beings and known as *Filaria perstans* are really embryos of some species of *Tylenchus*.

P. Manson,² in referring to Primrose's case of filariasis, states his belief that the disappearance of the filarias from the circulation was not due to the operation, but to the attack of lymphangitis. Manson then reports a case in which a similar **disappearance of filarias from the blood** was observed and was considered to be the **result of an attack of lymphangitis**. He has observed a number of other cases presenting a similar association of disappearance of the filarias with lymphangitis. He also notes some observations on *Filaria nocturna* and *Filaria diurna* that have led him to the belief that **the two are specifically distinct**. He refers, however, to the difficulty in reaching satisfactory conclusions from the examination of blood-smears, the results depending upon the thickness of the film of blood, the rapidity with which the blood dries, and the degree of extension or contraction exhibited by the embryo at the time of its death.

B. K. Ashford³ discusses a series of observations concerning **filariasis in Porto Rico**. He found a large number of cases in Ponce, and believes from his observations that about 10 % of the population were affected. At Cayey he made a **study of 250 native soldiers, and found 30 men infected**. These were about equally distributed among the various companies examined. The author does not believe that the troopers in this particular command had been the subjects of an increasing epidemic of filariasis, but thinks that those infected with the parasite had brought it into the service with them. He discusses various abnormalities produced by the disease, and states that elephantiasis is well known in Porto Rico and very frequent, but that few persons affected with filariasis ever reach this unfortunate stage. Surgical treatment for excessive elephantiasis of the lower extremities is often carried out, and the **methods of surgical treatment** are briefly considered by Ashford. **Filarial fevers are not uncommon**. They have a rapid, severe onset, and usually terminate within one or two days. One such case is described. The diagnosis in these cases is usually malaria. So-called dry buboes are also often seen. They are very painful, but do not, as a usual thing, tend to suppurate. In rare instances, however, th

¹ Lancet, Jan. 30, 1904.

² Brit. Med. Jour., Jan.

³ Med. Rec., Nov. 7, 1903.

do—probably with greater frequency in those that have latent or chronic venereal disease. Sometimes, too, the buboes are associated with red, inflamed lines, extending up the leg; and this may lead to erysipelas. Secondary infection may occur in cases of this sort, and may prove fatal. Ashford has seen malarial orchitis diagnosed a number of times, but filarias were always found in the blood. Treatment is extremely unsatisfactory. Methylene-blue has been given in large doses, for a long time, without effect. **Ichthyol is useful in recurrent lymphangitis.** As to the cases found infected, Ashford states that in 5 of the 30 instances he found presumptive evidence that the disease existed in the families of these men; and all had been thoroughly exposed to mosquitos in crowded towns before infection. All were young men; most had been in the service three years without serious illness. They came from all parts of the island. All but 4 had had attacks, occurring at irregular intervals, of inguinal or femoral adenitis, with chill, fever, and pain; and with red lines along the inner side of the leg and thigh. Most had had chyluria.

C. Christy¹ discusses the **peculiar infection known as tick fever.** He finds that the tick said by the natives to produce this disease is the *Ornithodoros moubata*. The disease is said to produce vomiting, headache, and pain in the abdominal region, with fever. These symptoms last for several weeks, but are not followed by a fatal result. The author particularly investigated the possible relation of *Filaria perstans* to this disease. One of his servants was bitten by a tick, and six days afterward had the usual symptoms. He had previously been repeatedly examined for parasites of various kinds, always with negative results. Subsequently to this illness he was repeatedly found to have *Filaria perstans* in his blood. A large proportion of the natives in the region in which this tick is found show the same organism in their blood, often in large numbers. Christy thinks it **possible that this disease is due to *Filaria perstans*.**

BILHARZIA DISEASE.

A. Kautsky Bey² contributes some interesting observations concerning bilharzia infection in Cairo and the **condition of the blood** found in the subjects of this infection. He examined 124 persons, and found either *Ankylostoma duodenale* or *Distomum hæmatobium* in all but 22. In 97 of the cases (78 %) he found bilharzia eggs in the urine also; and these patients were from the fairly-well- or well-cared-for classes of children. He divides his material into a group in which there was both bilharzia and ankylostoma infection; one in which there was only bilharzia; another, in which there was only ankylostoma; and a fourth, in which there was neither of these infections. In none of the cases was there pronounced reduction of the red corpuscles. There was, however, a marked reduction in hemoglobin; also a decided increase in the mono-

¹ Brit. Med. Jour., Sept. 19, 1903.

² Zeit. f. klin. Med., Bd. lii, Hefte 3 u. 4.

nuclear elements, although often not more noteworthy than is found in normal children. This increase he is inclined to attribute to the vegetable diet. There was a **decided eosinophilia in most of the bilharzia cases**. Charcot-Leyden crystals were absent from the stools. He believes that **bilharzia infection is an important factor in the etiology of Egyptian anemia**; while in children, at least, ankylostoma is of far less importance. His chief reasons for this belief are the frequent hemorrhages that occur in bilharzia infection; the comparative rarity of ankylostoma eggs in the stools; and the fact that in pure ankylostoma cases the hemoglobin was about normal, while in pure bilharzia cases or cases of bilharzia with ankylostoma the hemoglobin was much reduced. Also because of the eosinophilia, which did not occur in ankylostoma infection in his experience, but is always of regular occurrence in bilharzia infection. The latter point in particular indicates, he believes, that the bilharzia anemia is the result not only of hemorrhage, but also of a definite systemic poison.

A. Balfour¹ discusses the occurrence of **eosinophilia in bilharzia disease and dracontiasis**. He reports 3 cases of the former disease in which the count of eosinophiles was from 14 % to 18.4 %. There was also a proportionate diminution in the polymorphonuclears. Six cases of guineaworm disease are described. In these, the counts of eosinophiles ran from 6.4 % to 36.6 %. Balfour thinks it possible that a count of the eosinophiles may determine whether the whole of a guineaworm has been extracted.

T. N. and H. N. Rafferty² report their observations of the case previously reported from the clinical standpoint by E. Walker,³ in which they determined the presence of *Bilharzia hematobia* in various regions of the woman's body, including the blood from the lung, the stomach, the lower bowel, the peripheral circulation, and the kidney. The point of main importance about the case is that the **patient had never been out of the United States**, and had not even been in the southern States of this country.

DRACONTIASIS.

A. Powell,⁴ in relation to the **life-span of the guineaworm**, refers to a party of 16 persons with 5 servants who were exposed for 2 days, in April, 1902, to the possibility of infection, at Mahad. In April, 1903, the first worm made its appearance in one of the gentlemen of the party. Six of the gentlemen have since been attacked, and also one of the servants, 19 worms in all having been extracted. The **shortest interval between infection and the appearance of the worm is 345 days**; and the longest, 435. The great majority of the worms appear a year and two or three weeks after the date of infection. Powell thinks, therefore, that it is safe to conclude that none of the other members of the party will now show infection. He has frequently noted a good¹ of fever a few days before the worm has become palpable.

¹ Lancet, Dec. 12, 1903.

² Med. Rec., June

³ Jour. Am. Med. Assoc., Feb. 17, 1900. ⁴ Brit. Med. Jour.,

cases, there was swelling of the face and hands, which gave rise to a very marked feeling of tension. This swelling is observed even when the parasite has its seat in the lower extremities. The symptoms are important if malarial parasites are absent and there is a marked eosinophilia.

EUSTRONGYLUS INFECTION.

Stuertz¹ contributes an extensive report of a case in which eggs of the *Eustrongylus gigas* were found in the urine, in association with a chyluria that was determined to be unilateral by catheterizing. Chyluria began when the patient was living in Australia. After extensive discussion of the differential diagnosis, the conclusion was reached that the chyluria was probably due to the presence of the adult worm in the pelvis of the kidney on the affected side. Filarial disease having been excluded, the other factors pointed toward the diagnosis mentioned. Operation was, therefore, carried out; but **nothing abnormal about the kidney or in its neighborhood** could be discovered. The conclusion reached after this was that the adult worm must be in a situation communicating with the ureter through a fistula. The author thinks that this is the **first time that the presence of this parasite has been satisfactorily determined during life**. He insists upon the importance of the observation of chyluria due to this parasite. The eggs were very hard to find in this case, and also very scarce. There were likewise present some other eggs, the nature of which could not be determined. Stuertz reviews the cases reported as human infection with *Eustrongylus gigas*. Of the 21, he considers 6 to have been unquestionable; 1, probable; 7, very questionable; and 7, probably not infections with this parasite. The chyluria, he believes, is due to the damage done by the worm in fastening itself in the tissues. He thinks that in cases of chyluria it is **important to determine whether the chyle comes from one or from both ureters**; as this knowledge may lead to a more successful result than was accomplished in this case. He subsequently attempted to infect various fish, and also dogs, with the eggs; but had no success.

HYDATID DISEASE.

A. A. Lendon² discusses the **medical aspects of hydatid disease**, referring to the **frequency of this disease in Australia**, and mentioning several cases. One of these was in a woman of 48, **supposed to have gallstone colic**. On the day before a proposed operation she passed a daughter cyst by the bowel. Operation showed a large suppurating hydatid. The patient recovered. In another case a **cyst of the dome of the liver was diagnosed**, because there were signs suggesting fluid at the lower part of the chest; and yet tapping showed little fluid in the pleural cavity. There was also hectic fever, indicating

¹ Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 5 u. 6.

² Intercolonial Medical Jour. of Australasia, July 20, 1903.

suppuration; furthermore, the patient had lived in the country where hydatid is not uncommon. Operation showed the correctness of the diagnosis, and resulted in the cure of the patient. The author mentions a third case, in which **an ovarian cyst was thought to be present**. It proved, however, to be a hydatid, originating in the right hypochondrium—the exact origin not being determinable at operation. In a fourth case there was an **omental hydatid, which produced a mass in the right hypochondriac and lumbar regions**. Lendon thinks that the so-called hydatid thrill is extremely characteristic when present; though he mentions the views of others that do not consider it pathognomonic. He also refers to the **“sonorous booming”** of Santini, which he considers to be probably valuable. This is elicited by percussing and auscultating at the same time. In the diagnosis of abdominal cyst he mentions the importance of multiplicity of the cysts. In discussing thoracic cysts he refers to the **resemblance to advanced phthisis**, when sepsis supervenes—bacilli, however, being absent. He considers a definite history of rupture of the cyst to be extremely important, sepsis occurring in pulmonary cyst only when rupture has taken place. The peculiar taste of the sputum is also often helpful. In brain-cases left to nature the death-rate is about 96 %; when operated upon, it is 50 %. In the cases of hydatid of the lung, about two-thirds die if unoperated upon; and only about 10 % if operated upon. In abdominal cases, operation gives more satisfactory results than in any other variety.

DISEASES OF METABOLISM.

GLYCOSURIA AND DIABETES MELLITUS.

E. C. Van Leersun¹ has investigated the cause of the **reduction of Fehling's solution** that frequently occurs in **icteric urine**, even when sugar is absent. He finds that in such circumstances **glycuronic acid** is present in the urine; and that it is this, and not the bile-pigment, that causes the reduction. He believes that glycuronic acid can be demonstrated to be one of the normal components of the body-fluids.

F. Blumenthal and H. Wolff² have made a study of the **excretion of glycuronic acid in fever**, and find that it is frequently increased. They believe, however, that only when glucose is also present can one state that there is reduced oxidative power of the organism. They think that it is not readily possible to state the cause of the increased excretion of glycuronic acid, and consider that it is not certainly a direct indication of toxemia; because there is no direct parallelism between the amount of glycuronic acid and the fever and between the amount of glycuronic acid and that of aromatic products.

E. Behrendt³ describes a **new method for the quantitative esti-**

¹ Hofmeister's Beiträge, Bd. iii, Heft 12.

² Zeit. f. klin. Med., Bd. lii, Hefte 3 u. 4.

³ Deut. med. Woch., 1903, No. 35.

mation of sugar in the urine. It consists in placing a special alkaline bismuth-solution over urine in a test-tube, using 10 cc. each of urine and of bismuth-solution. He then warms the mixture and reads off the volume of the bismuth-precipitate. He has constructed a table to indicate the amount of sugar shown by varying amounts of precipitate. He considers the method accurate for clinical purposes.

H. Wolff¹ and P. Goldmann² have both studied the method, and have both reached the conclusion that it is so **inaccurate and unreliable** as to be entirely useless in its present form.

Pentosuria.—M. Bial³ has modified his **reaction for pentose** so that it is now carried out by heating 4 cc. or 5 cc. of the reagent to the boiling-point, removing it from the flame, and allowing a few drops (at most, 1 cc.) of urine to flow in. If pentoses are present, a brilliant green color at once appears. Performed in this way, the reaction is, he considers, very delicate and easy to carry out. He states that it does not occur with glycuronic acid compounds. He makes the reagent as follows: 500 cc. of 30 % HCl, 1 gram of orcin, and 25 drops of ferric-chlorid solution.

Bial⁴ demonstrated to the Berlin Medical Society the urine from a case of pentosuria in which, on account of a positive copper test, the diagnosis of diabetes had repeatedly been made. It is an interesting fact in this case that this **apparently harmless anomaly was a familiar characteristic**, 3 other members of this patient's family, all middle-aged, having shown the same condition, and all having been considered to have diabetes.

E. Bendix⁵ reports a case of pentosuria. A study of **literature showed only 12 cases** that he considers to have been real pentosuria, and of these, 2 were somewhat questionable. The condition, therefore, is evidently rare, since it has been known for a decade. Bendix's patient was a man of 52, with a good family and personal history. About a year before he had had a severe attack of influenza with a long convalescence. At this time he was found to have in the urine a reducing substance, which proved to be pentose. He had no symptoms of diabetes, and had never used any of the alkaloids which may cause the presence of reducing substances in the urine. The patient also had a continuous albuminuria. Acetone and diacetic acid were absent. The amount of pentose varied from 0.4 % to 0.6 %. It was optically inactive. The fact that it was pentose was definitely determined by a series of characteristic tests.

LEVULOSURIA.

A. Lion⁶ discusses the question of the **coincident appearance of levulose and dextrose** in the urine; and reports a remarkable case in

¹ Deut. med. Woch., 1903, No. 49.

² Ibid.

³ Deut. med. Woch., July 2, 1903.

⁴ Zent. f. inn. Med., Jan. 30, 1904, p. 133.

⁵ Münch. med. Woch., Sept. 8, 1903.

⁶ Münch. med. Woch., June 30, 1903.

which reduction-tests and fermentation showed a large amount of sugar, while the polarimeter gave a practically negative result. After having determined that this was not due to the presence of pentoses nor to that of β -oxybutyric acid or glycuronic acid, and that actual sugar, furnishing an osazone that melted at 204° C., was present, the author concluded that the result could be due only to the coincident presence of dextrose and levulose. It was found that the patient responded to the administration of both dextrose and levulose, in the one case by dextrosuria and in the other by levulosuria; but that levulose appeared in the urine much more readily than did dextrose. The patient was acutely ill at the time with articular rheumatism; and as he recovered, the sugar disappeared from the urine. It was found that he still exhibited a slight degree of alimentary levulosuria, while the alimentary dextrosuria had disappeared. **The importance of this result in relation to Strauss's test** for disease of the liver is mentioned, and also the especial importance of such a result in relation to determining the presence or the absence of sugar in the urine by means of the polariscope. In such a case it could not have been determined with one instrument alone that any sugar was present; and in many cases, perhaps, the quantitative determination of the amount of sugar would be very much disturbed by the coincident presence of varying amounts of dextrose and levulose.

GLYCOSURIA.

F. Ehler¹ reports an interesting case of glycosuria which occurred in a woman of 32 years. The patient had had **repeated attacks of cholelithiasis**, which became associated with glycosuria, at well as with polydipsia and polyuria. Cholecystotomy was done, and a gallstone was removed from the cystic duct. The next day the sugar disappeared and did not return. Sheer believes that the cause of the glycosuria was **compression of the head of the pancreas** by the dilated gallbladder, which projected toward the left and backward.

H. Stern² discusses the occurrence of **diabetic and nondiabetic glycosuria** in the same individual, basing the distinction upon the presence in the cases of diabetic glycosuria of other symptoms of diabetes and the absence of such symptoms in cases of nondiabetic glycosuria. If the symptoms of diabetes disappear, leaving only glycosuria, Stern apparently makes upon this basis a diagnosis of nondiabetic glycosuria in the same individual. [In the present confused state of our knowledge concerning glycosuria and diabetes it is practically impossible to diagnose the coincidence of the two in the same individual.]

¹ Beiträge zur Path. der Glykosurie [casopis lekarie ceskych., 1903, p. 634]; Zeit. f. inn. Med., 1903, S. 1146.

² Amer. Med., Mar. 19, 1904.

NATURE AND ETIOLOGY OF DIABETES.

O. Cohnheim¹ has made a study of the decomposition of sugar by a combination of muscle and pancreatic substance. He describes his method of preparing the muscle and the pancreas, which consists in the use of Kossel's machine, in which these organs are frozen with carbonic acid. The frozen mass is then cut with a rotary knife into a snow-like substance. It is then subjected to a pressure of about 300 atmospheres. Mixtures of muscle and pancreas, as well as muscle and pancreas separately, were used. After being placed in toluol water, they were allowed to stand overnight in the incubator. The sugar was determined by Pavy's method. The author reaches the conclusion that his results demonstrate that **muscle and pancreas together destroy sugar**, but that these organs separately are not able to accomplish this. The amount destroyed is large enough to constitute an explanation of the conditions that occur in the living body. Blood-serum apparently checks the glycolytic action to some extent, and the presence of active trypsin also apparently interferes with the process. Cohnheim does not believe that the glycolysis could have been due to bacteria, since he used toluol; and since the destruction of sugar was the more marked during the first few hours, while the bacteria in the later hours are those in which the greater amount is destroyed. He therefore concludes that in order to carry out the decomposition of sugar in the body, the muscles and the pancreas, working together, are necessary; and that it is done by means of a ferment. This may be due to the two organs' providing a complement and an intermediary body, or to an action similar to that of Pawlow's enterokinase.

R. Hirsch² had similar results with liver and pancreas together, but expresses herself more guardedly than does Cohnheim concerning the physiologic importance of the observations [taking, thereby, a sounder position than Cohnheim].

J. Stoklasa³ replies to the criticisms of his glycolytic experiments and the conclusions that have been made by various other observers, and decides that the reason that others have not been able to demonstrate **alcoholic fermentation** is that they have not worked in a **purely hydrogen atmosphere** or have not used absolutely fresh organs. Perhaps, also, they have been confused by the two forms of fermentation—**lactic acid fermentation and alcoholic fermentation**—that Stoklasa thinks occur. The ferments producing alcohol are readily destroyed by proteolytic enzymes, and this may have caused confusion. Stoklasa still insists that various organs produce glycolysis, and that this is alcoholic glycolysis. He believes that the observation he claims to have made, that there is both an alcoholic and a lactic-acid fermentation, explains diabetes and the acid-intoxication in that disease. If the alcoholic fermentative process is disturbed, there is an excessive production of lactic acid and other fatty acids; and this probably causes

¹ Zeitsch. f. physiol. Chemie, Bd. xxxix, Hefte 3 u. 4.

² Hofmeister's Beiträge, 1903.

³ Deut. med. Woch., Feb. 4, 1904.

large excretion of acids in the urine [a remark that is not in accord with the important clinical fact that it is the fats, not carbohydrate foods, that produce acid-intoxication; and that administering carbohydrates tends to decrease this acid-intoxication, rather than to increase it].

F. Blumenthal¹ gives a discussion of the question of the importance of a glycolytic ferment. After reviewing his own work and that recently done by others, he makes a very attractive but **theoretic scheme of the physiologic importance** and the manner of action of this ferment. He believes that the destruction of sugar in the organism is due to a specific ferment, which, however, is probably present in all tissues. He believes that this ferment produces carbonic acid, fatty acids, and a slight amount of alcohol. The pancreas influences the activity of the ferment favorably; but in a manner that is, as yet, unexplained. Blumenthal thinks that the leukocytes carry the glycolytic ferment to the muscles, the ferment being bound to the leukocytes in order to prevent its acting in the blood-stream. If it did act in the latter situation, much of the energy needed by the muscles would be practically lost. After it reaches the muscles it is activated by the kinase-like substance provided by the pancreas. In severe diabetes the glycolytic ferment has, in a number of cases, been found absent from the liver. Blumenthal thinks, from this fact and from theoretic considerations, that diabetes is due to a lack of sufficient glycolytic action, partly owing to the absence of the kinase provided by the pancreas, but partly owing to a considerable loss in the want of proper production of the glycolytic ferment by the tissues. He makes a statement [that must, as yet, be considered entirely improbable] that the near future is likely to see a satisfactory treatment of diabetes through the subcutaneous administration of glycolytic ferment.

A. Braunstein² contributes some observations concerning glycolysis. He finds that the **pancreas itself has glycolytic action**, and believes that contrary results are due to the disturbing influence of the pentoses. He also finds that a glycolytic ferment isolated from blood-clots acts with great rapidity, even without any addition of pancreatic tissue, destroying, indeed, more sugar within the same time than do other tissues with the addition of pancreas. This he believes to indicate that glycolysis is not due to the action of two substances like the amboceptor and the complement. He thinks that there are other reasons for believing that the **glycolytic ferment is bound to the leukocytes** and that destruction of the leukocytes causes increased glycolysis.

C. Ramus,³ in a general discussion of the nature of diabetes, states that he has made an attempt to demonstrate a pancreatic enzyme capable of converting dextrose into alcohol. Two experiments showed the presence of a substance giving the reactions of alcohol, and he believes that it was **probably alcohol produced by the pancreatic enzyme**. [The results were, however, entirely unconvincing.]

¹ Deut. med. Woch., Dec. 17, 1903.

² Zeit. f. klin. Med., Bd. li, Hefte 5 u. 6.

³ Jour. Am. Med. Assoc., Feb. 6, 1904.

H. Luthje¹ has made an interesting study of the question **whether the power of destroying sugar is completely lost after extirpation of the pancreas.** He first refers to the fact that if dogs that have been subjected to pancreatectomy are allowed to starve, the sugar disappears gradually and often entirely from the urine. In such a case, after the sugar had disappeared, he determined the amount of sugar present in the blood, and found it to be 0.203 %. To his surprise, however, it was found, by making serial sections of the duodenum and of the neighboring peritoneum, that small remnants of pancreas were still present; although the operation had been carefully carried out and all the pancreas was thought to have been removed. To overcome this difficulty, he removed the entire duodenum with the pancreas from another animal; and in this case, after the disappearance of the sugar in the urine, he determined the blood-sugar and found it to be 0.312 %. He states positively that this dog, from which the pancreas had been completely removed, **had not entirely lost its sugar-destroying power.** He believes that the best explanation of this is probably that the sugar formed solely from the destruction of body-tissue is much more readily decomposed by the diabetic subject than is that from any other source, and thinks that this explains his results. That is, diabetic animals, when starved, ultimately come to a point at which they are living solely upon their own tissues; and, at this point, they are capable of decomposing all, or nearly all, the sugar that is formed. He believes that this explains the reduction of the glycosuria in cases of severe cachexia, such as that of carcinoma; and in some cases of nephritis, etc. The amount of nitrogen excreted in the urine of the dogs observed, he believes, supports this idea. [It seems wholly possible that, like birds, mammals destroy about as much sugar as the kidneys leave unexcreted, even after removal of the pancreas; but that mammals are much more sensitive to hyperglycemia than birds, and hence excrete a much larger portion of the sugar.]

J. E. Sweet² in a study of the bacteriolytic complement, has made the important observation that dogs which have been rendered diabetic by extirpating the pancreas show a very **marked decrease in the hemolytic activity** of the serum toward both rabbits' and guineapigs' erythrocytes, and also a **complete loss of the normal bactericidal power** of the serum. This apparently explains the marked tendency of diabetics to infections. The reduction in hemolytic activity is due to a loss of hemolytic complements. Probably the loss of bactericidal power is also due to the loss of the complement. The pancreas must be removed completely, in order to produce this loss of complements; but even after complete removal, the organism can react to inflammatory processes by an increase of the complements. Sweet believes that he has demonstrated that there is no relation between the leukocytes and the complement.

P. F. Richter³ has investigated the **influence of fever and of in-**

¹ Münch. med. Woch., Sept. 8, 1903.

² Jour. of Med. Research, Oct., 1903.

³ Berl. klin. Woch., Sept. 14, 1903.

fection upon the excretion of sugar, particularly their influence upon an adrenalin glycosuria. He finds that in the majority of cases when bacterial infection with streptococci is carried out, glycosuria does not appear after the use of adrenalin. He also finds that experimental fever, produced by the Sachs-Aronson puncture, has apparently little or no effect upon an adrenalin glycosuria. He therefore decides that **fever is without influence upon glycosuria, while bacterial infection has a decided effect** in decreasing the excretion of sugar. He thinks that we may definitely decide that the influence of infectious fevers in reducing sugar-excretion is due to the element of infection; while in cases in which the fever is little influenced we must decide either that the toxemia of the infection has been relatively slight, while the other elements in the case have been more severe; or else that different bacteria have different influences upon glycosuria.

W. Croner,¹ in discussing 100 cases of diabetes mellitus observed in a walking clinic, with particular reference to their **relation to tuberculosis and to arteriosclerosis**, reaches the conclusion that there apparently has been a **definite increase in the number of cases of diabetes**; and that there is a **distinct hereditary predisposition** to the disease. He refers to one instance in which a father acquired the disease in a mild form and the son afterward showed it in a severer form, and in which the history stated that the father's brother and two of this brother's sons had died of the disease. In relation to tuberculosis Croner discusses the views of others concerning the close association of this disease and diabetes, and then states his belief that the cause of this association is a hereditary predisposition that tends to develop either tuberculosis or diabetes in the same family or to develop both diseases in the same individuals. He thinks that the occurrence of diabetes in later life often indicates that the patients have had a predisposition to tuberculosis, but have escaped that disease and ultimately become diabetic. Of his 100 cases of diabetes, 47 patients were tuberculous or had tuberculous families; and 16 of the diabetics themselves had tuberculosis. He also thinks that arteriosclerosis frequently occurs in diabetics, because there is some primary factor that tends to produce both arteriosclerosis and diabetes. This, he believes, is, in many instances, alcoholism. He refers to the fact that of his 100 cases, 41 showed alcoholic excess. He believes that alcoholism does not produce diabetes if it is associated with hard physical labor, but that it tends to do so in persons of intellectual or sedentary habits. [Many of Croner's views are based almost entirely upon personal fancy and theory; and some of them are in opposition to facts quite thoroughly established.]

SYMPTOMATOLOGY AND COMPLICATIONS.

Teschemacher² has observed Dupuytren's contract in 33 of 213 diabetics. He thinks, therefore, that it is more common in persons suffering with that disease than in persons not suffering with it.

¹ Deut. med. Woch., Nov. 5, 1903.

² Deut. med.

attempted to determine why this is the case, and reached the conclusion that it is probably a trophoneurotic process. It is not due to local traumatic causes, because most of the patients were of the better classes. Gout was not the cause either, as distinct gout was present in only one case.

Martinet¹ reports an instance of **family diabetes**. A man, his wife, and his mother all exhibited diabetes under the observation of the author; while the father had previously died of the disease. Martinet considers that if diabetes is found in one or several members of a family, all the other members should be examined for the possible presence of the disease.

S. Hart and W. J. Gies² reports a case of **diabetes terminating in coma**, with a series of estimations of the amount of acetone, diacetic acid, betaoxybutyric acid, sugar, total nitrogen, and ammonia nitrogen. They found the ammonia nitrogen greatly increased as coma was approaching. Acetone was also markedly increased at this time; and there was a considerable, though variable, quantity of oxybutyric acid present. The patient had been on a restricted diet just before the onset of the coma. The authors emphasize the fact that to determine the ratio of the **ammonia nitrogen to the total nitrogen ratio is extremely important in prognosis**; and also that the use of carbohydrates may not be restricted with impunity, while in some cases a restriction of the fats and a continuance of the carbohydrates may be advantageous.

G. Parker³ reports a **case of bronzed diabetes** in a man of 65 years, who had recently developed the symptoms of diabetes and was found to have over 5 % of sugar. The skin had a dusky metallic hue, particularly in certain areas. The liver and the spleen were not palpable. The patient died in coma, and necropsy showed diffuse pigmentation of a brownish color in various tissues. The suprarenals were firm and somewhat darker than normal, but otherwise showed no changes. The liver was cirrhotic, much nodulated, and decidedly pigmented. The pancreas was small, firm, and pigmented. Even the cartilages of the ribs showed pigmentation, and many lymphatic glands were likewise pigmented. The granules of the liver showed a marked iron-reaction. The pigment in the pancreas also gave iron-reactions, and was deposited chiefly among the cells of the parenchyma. The spleen was fibroid. There was general arteriosclerosis. Parker agrees with the view that the chief factor in bronzed diabetes is a **loss of the power to eliminate blood-pigments**, rather than excessive hemolysis. He believes that the **diabetes is secondary**.

Fraser⁴ describes a **remarkable case of lipemia in a case of diabetes** occurring in a boy of 17 years. The case ended with coma. The lipemia was found several weeks before death, microscopic examination of the blood having shown innumerable fine granulations, which had a rapid oscillatory movement. After standing, they showed many small refractile droplets, which gave characteristic stains with osmic acid in Sudan

¹ La Presse méd., Feb. 10, 1904.

² Am. Jour. Med. Sci., Aug., 1903.

³ Brit. Med. Jour., Oct. 24, 1904.

⁴ Scottish Med. and Surg. Jour., Sept., 1903.

III. The retinal vessels had an opaque white appearance. Blood removed at autopsy showed a lower dark coagulum; above this, a creamy layer of fat; and over this, turbid serum. Large quantities of milky fluid were found in the serous cavities; and the vessels on the surface of the brain contained milky fluid, as did the vessels of the other organs. This fluid also gave characteristic stains for fat. Fatty degeneration was not marked in the tissues. Blood taken from the femoral artery showed 16.44 % of fat. The pleural exudate showed 18.94 %—an enormous increase over the normal, and over uncomplicated diabetes; only one case showing a higher percentage having been reported. The author considers it very important to recognize lipemia early. While the lipemia itself is not a source of great danger, and is not the cause of coma, it is probable that it depends upon the same factors as does the acidosis that produces the coma.

W. Hale White¹ reports a case of diabetes in which a lipemic condition of the blood was **recognized through examination of the retinal vessels**. He believes that lipemia is not extremely rare, as he has seen at least one other case, in Guy's Hospital, in which the condition was recognized by an examination of the retinal vessels. The arteries and veins contained blood, which was of a deep cream or pale salmon color. The patient was 26 years old; and although he had advanced to drowsiness and a fatal issue at one time seemed certain, he improved greatly. Under the microscope the blood showed many crystals, but no globules and nothing that stained with osmic acid. The drawn blood, however, was very milky; and the serum after clotting was milky.

E. Neisser and L. Derlin² report a case of diabetes with lipemia, the latter having occurred during diabetic coma. They made examinations of the fat, to determine whether it had the usual **characteristics of human fat**. They found that it practically agreed with the figures found by Erben for human chyle-fat. Apparently, then, it came from the food, and not from the tissues.

R. T. Williamson³ describes the **changes in the spinal cord** in a case of severe diabetes mellitus. The patient had had "symptoms of diabetic coma," but these had disappeared after the use of large doses of alkali. The knee-jerk and the tendo Achillis jerk were absent. Goll's column showed some degeneration, even macroscopically. Microscopic examination showed an excess of nuclei in Goll's column in the cervical region, and the nerve-fibers were diminished in size; though in a few instances they showed swollen axis-cylinders, and the myelin sheaths were sometimes distended. With Marchi's method, degenerated fibers were observed chiefly in the cervical region. A few degenerated fibers were found in Burdach's column. In a few sections the posterior roots showed degenerated fibers for a short distance just outside the pia mater. The changes described were probably secondary to the alterations in the blood and tissue-fluids. Williamson thinks †

¹ Lancet, Oct. 10, 1903.

² Zeit. f. klin. Med., Bd. li, Hefte 5

³ Brit. Med. Jour., Jan. 16, 1904.

some cases the loss of the tendon-reflexes in the legs is not due to disease of the nerves, but to changes in the fibers in the posterior roots.

Treatment.—C. von Noorden¹ makes an interesting contribution concerning the use of oats in the treatment of severe diabetes mellitus. He refers to the fact that the use of carbohydrates in severe diabetes is sometimes, to one's surprise, followed by a reduction in the glycosuria, after strict dieting has been found ineffectual. Such results have been obtained with milk, which, of course, contains a considerable amount of sugar; and also with potatoes (Mossé). Such a treatment, however, can by no means be used with any freedom, as it sometimes results in much damage. A similar effect is that observed after the use of oats. The author especially insists that this treatment is by no means always successful, and that it **should be used with care in individual cases**; but that in some cases it seems to be sufficient to control—at times, completely—a diabetic glycosuria that has not previously been influenced by the most stringent diet. Ordinarily he uses Knorr's oatmeal or some similar preparation. This is boiled for a long time with water containing a little salt; and during the boiling butter and vegetable albumin are added. The author commonly employs "roborat," but one may, if desired, use egg-albumen instead, adding it after the oatmeal has cooled. The amount given during the day consisted of 250 grams of oats, 100 grams of albumin, and 300 grams of butter. Von Noorden describes a number of cases illustrating the influence of this diet upon the glycosuria; upon the excretion of acetone, nitrogen, and ammonia; and upon the body-weight. In the first case reported the influence was extremely satisfactory in all ways. In the second case a less satisfactory but still valuable influence was observed. The same is true of the third case. In the fourth practically no result was obtained. The excretion of sugar is not always indicative of the effect that this diet will have, for cases with a mild glycosuria do not always respond well; indeed, many mild cases bear this treatment badly. It is more valuable in the severe cases than in any others. The author believes that it is a more useful treatment than is the potato-cure, and that oats are probably better to use than any other carbohydrate, in a great proportion of the cases. [The remarkable differences in the response of different diabetics to different carbohydrates make it seem more than ever possible that we shall some day recognize in diagnosis as well as in therapeutics that the term "diabetes" includes numerous different abnormalities.]

J. Sawyer,² in referring to Mossé's observations concerning the use of potatoes in the diet of diabetics, states that he has had excellent results from this measure, and that he believes potatoes may be wisely used in various ways; for instance, in preparing bread, soups, etc.

L. Mohr³ contributes a discussion of sugar-production within the organism in diabetes mellitus, and demonstrates his belief that **various kinds of proteids have a decidedly different influence** upon the

¹ Berl. klin. Woch., Sept. 7, 1903. ² Brit. Med. Jour., March 5, 1904.

³ Zeit. f. klin. Med., Bd. lii, Hefte 3 u. 4.

excretion of sugar—a matter of considerable importance in dietetics. He also thinks that his investigations have demonstrated that it is highly probable that fats as well as proteids can be sources of sugar [a view that is yet far from being generally accepted].

Goliner¹ has used **levuretin**, a substance prepared from beer-yeast and containing its active principle, in the treatment of diabetes, giving three times daily a teaspoonful in water or soup. This causes the breaking-up of the carbohydrates in the gastrointestinal tract, but the patients are free from the distress of the complete or almost complete elimination of carbohydrates from their diet. The author finds that by this means it is possible to reduce the sugar-content of the urine, and to increase the body-weight, at the same time that the general condition improves decidedly, in spite of the fact that the diet is not restricted. [This treatment must necessarily be of only limited value and need care in its use.]

DIABETES INSIPIDUS.

K. Pichler² reports a case of diabetes insipidus in which there was a **diffuse ependymitis in the fourth ventricle**, which had caused obstruction of the aqueduct of Sylvius and internal hydrocephalus. During life the patient had shown no vertigo, headache, or paralyses of the cranial nerves, and the pulse had been of moderate frequency. The patient was weak at the time of his death, but death occurred with unexpected suddenness. Microscopic examination of the floor of the ventricle showed that there was infiltration with granulation-tissue and more or less formation of fibrous tissue. The similar cases that have been reported are briefly discussed.

Finkelnburg,³ in discussing immobility of the pupils in hereditary syphilis, describes a case of diabetes insipidus in which the only cerebral symptom that could be discovered was a **bilateral reflex immobility of the pupils**. There was no definite evidence of syphilis in the case. [Observations such as those of Pribram (YEAR BOOK, 1904) show that syphilis is by no means an essential consideration under such circumstances.]

L. Feilchenfeld⁴ reports a case of polyuria and one of typical diabetes insipidus in which he used **subcutaneous injections of strychnin** for a long time, with decided improvement of the condition, the excretion of urine being reduced from more than 4000 cc. to about 2500 cc.

A. Wolff⁵ reports a case of hereditary diabetes insipidus in which the excretion of urine was enormous, at times reaching as much as 11 liters. Treatment with opium, aspirin, and other drugs had been without effect, and Liebermeister recommended **secale** as an infusion (6:200), a tablespoonful of this being given two or three times a day. The amount of urine became rapidly reduced, and finally became as low as 1.5 to 2.5 liters. Immediately after the use of the drug the feeling of

¹ Therap. Monatshefte, Aug., 1903. ² Zeit. f. inn. Med., Aug. 1, 1904

³ Deut. Zeitsch. f. Nervenheilk., Bd. xxiii, Hefte 5 u. 6.

⁴ Deut. med. Woch., 1903, No. 31. ⁵ Münch. med. Woch., 1903,

cases, there was swelling of the face and hands, which gave rise to a very marked feeling of tension. This swelling is observed even when the parasite has its seat in the lower extremities. The symptoms are important if malarial parasites are absent and there is a marked eosinophilia.

EUSTRONGYLUS INFECTION.

Stuertz¹ contributes an extensive report of a case in which eggs of the *Eustrongylus gigas* were found in the urine, in association with a chyluria that was determined to be unilateral by catheterizing. Chyluria began when the patient was living in Australia. After extensive discussion of the differential diagnosis, the conclusion was reached that the chyluria was probably due to the presence of the adult worm in the pelvis of the kidney on the affected side. Filarial disease having been excluded, the other factors pointed toward the diagnosis mentioned. Operation was, therefore, carried out; but **nothing abnormal about the kidney or in its neighborhood** could be discovered. The conclusion reached after this was that the adult worm must be in a situation communicating with the ureter through a fistula. The author thinks that this is the **first time that the presence of this parasite has been satisfactorily determined during life**. He insists upon the importance of the observation of chyluria due to this parasite. The eggs were very hard to find in this case, and also very scarce. There were likewise present some other eggs, the nature of which could not be determined. Stuertz reviews the cases reported as human infection with *Eustrongylus gigas*. Of the 21, he considers 6 to have been unquestionable; 1, probable; 7, very questionable; and 7, probably not infections with this parasite. The chyluria, he believes, is due to the damage done by the worm in fastening itself in the tissues. He thinks that in cases of chyluria it is **important to determine whether the chyle comes from one or from both ureters**; as this knowledge may lead to a more successful result than was accomplished in this case. He subsequently attempted to infect various fish, and also dogs, with the eggs; but had no success.

HYDATID DISEASE.

A. A. Lendon² discusses the **medical aspects of hydatid disease**, referring to the **frequency of this disease in Australia**, and mentioning several cases. One of these was in a woman of 48, **supposed to have gallstone colic**. On the day before a proposed operation she passed a daughter cyst by the bowel. Operation showed a large suppurating hydatid. The patient recovered. In another case a **cyst of the dome of the liver was diagnosed**, because there were signs suggesting fluid at the lower part of the chest; and yet tapping showed little fluid in the pleural cavity. There was also hectic fever, indicating

¹ Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 5 u. 6.

² Intercolonial Medical Jour. of Australasia, July 20, 1903.

suppuration; furthermore, the patient had lived in the country where hydatid is not uncommon. Operation showed the correctness of the diagnosis, and resulted in the cure of the patient. The author mentions a third case, in which **an ovarian cyst was thought to be present**. It proved, however, to be a hydatid, originating in the right hypochondrium—the exact origin not being determinable at operation. In a fourth case there was an **omental hydatid, which produced a mass in the right hypochondriac and lumbar regions**. Lendon thinks that the so-called hydatid thrill is extremely characteristic when present; though he mentions the views of others that do not consider it pathognomonic. He also refers to the **“sonorous booming”** of Santini, which he considers to be probably valuable. This is elicited by percussing and auscultating at the same time. In the diagnosis of abdominal cyst he mentions the importance of multiplicity of the cysts. In discussing thoracic cysts he refers to the **resemblance to advanced phthisis**, when sepsis supervenes—bacilli, however, being absent. He considers a definite history of rupture of the cyst to be extremely important, sepsis occurring in pulmonary cyst only when rupture has taken place. The peculiar taste of the sputum is also often helpful. In brain-cases left to nature the death-rate is about 96 %; when operated upon, it is 50 %. In the cases of hydatid of the lung, about two-thirds die if unoperated upon; and only about 10 % if operated upon. In abdominal cases, operation gives more satisfactory results than in any other variety.

DISEASES OF METABOLISM.

GLYCOSURIA AND DIABETES MELLITUS.

E. C. Van Leersun¹ has investigated the cause of the **reduction of Fehling's solution** that frequently occurs in **icteric urine**, even when sugar is absent. He finds that in such circumstances **glycuronic acid** is present in the urine; and that it is this, and not the bile-pigment, that causes the reduction. He believes that glycuronic acid can be demonstrated to be one of the normal components of the body-fluids.

F. Blumenthal and H. Wolff² have made a study of the **excretion of glycuronic acid in fever**, and find that it is frequently increased. They believe, however, that only when glucose is also present can one state that there is reduced oxidative power of the organism. They think that it is not readily possible to state the cause of the increased excretion of glycuronic acid, and consider that it is not certainly a direct indication of toxemia; because there is no direct parallelism between the amount of glycuronic acid and the fever and between the amount of glycuronic acid and that of aromatic products.

E. Behrendt³ describes a **new method for the quantitative esti-**

¹ Hofmeister's Beiträge, Bd. iii, Heft 12.

² Zeit. f. klin. Med., Bd. lii, Hefte 3 u. 4.

³ Deut. med. Woch., 1903, No. 35.

mation of sugar in the urine. It consists in placing a special alkaline bismuth-solution over urine in a test-tube, using 10 cc. each of urine and of bismuth-solution. He then warms the mixture and reads off the volume of the bismuth-precipitate. He has constructed a table to indicate the amount of sugar shown by varying amounts of precipitate. He considers the method accurate for clinical purposes.

H. Wolff¹ and P. Goldmann² have both studied the method, and have both reached the conclusion that it is so **inaccurate and unreliable** as to be entirely useless in its present form.

Pentosuria.—M. Bial³ has modified his **reaction for pentose** so that it is now carried out by heating 4 cc. or 5 cc. of the reagent to the boiling-point, removing it from the flame, and allowing a few drops (at most, 1 cc.) of urine to flow in. If pentoses are present, a brilliant green color at once appears. Performed in this way, the reaction is, he considers, very delicate and easy to carry out. He states that it does not occur with glycuronic acid compounds. He makes the reagent as follows: 500 cc. of 30 % HCl, 1 gram of orcin, and 25 drops of ferric-chlorid solution.

Bial⁴ demonstrated to the Berlin Medical Society the urine from a case of pentosuria in which, on account of a positive copper test, the diagnosis of diabetes had repeatedly been made. It is an interesting fact in this case that this **apparently harmless anomaly was a familiar characteristic**, 3 other members of this patient's family, all middle-aged, having shown the same condition, and all having been considered to have diabetes.

E. Bendix⁵ reports a case of pentosuria. A study of **literature showed only 12 cases** that he considers to have been real pentosuria, and of these, 2 were somewhat questionable. The condition, therefore, is evidently rare, since it has been known for a decade. Bendix's patient was a man of 52, with a good family and personal history. About a year before he had had a severe attack of influenza with a long convalescence. At this time he was found to have in the urine a reducing substance, which proved to be pentose. He had no symptoms of diabetes, and had never used any of the alkaloids which may cause the presence of reducing substances in the urine. The patient also had a continuous albuminuria. Acetone and diacetic acid were absent. The amount of pentose varied from 0.4 % to 0.6 %. It was optically inactive. The fact that it was pentose was definitely determined by a series of characteristic tests.

LEVULOSURIA.

A. Lion⁶ discusses the question of the **coincident appearance of levulose and dextrose** in the urine; and reports a remarkable case in

¹ Deut. med. Woch., 1903, No. 49.

² Ibid.

³ Deut. med. Woch., July 2, 1903.

⁴ Zent. f. inn. Med., Jan. 30, 1904, p. 133.

⁵ Münch. med. Woch., Sept. 8, 1903.

⁶ Münch. med. Woch., June 30, 1903.

which reduction-tests and fermentation showed a large amount of sugar, while the polarimeter gave a practically negative result. After having determined that this was not due to the presence of pentoses nor to that of β -oxybutyric acid or glycuronic acid, and that actual sugar, furnishing an osazone that melted at 204° C., was present, the author concluded that the result could be due only to the coincident presence of dextrose and levulose. It was found that the patient responded to the administration of both dextrose and levulose, in the one case by dextrosuria and in the other by levulosuria; but that levulose appeared in the urine much more readily than did dextrose. The patient was acutely ill at the time with articular rheumatism; and as he recovered, the sugar disappeared from the urine. It was found that he still exhibited a slight degree of alimentary levulosuria, while the alimentary dextrosuria had disappeared. **The importance of this result in relation to Strauss's test** for disease of the liver is mentioned, and also the especial importance of such a result in relation to determining the presence or the absence of sugar in the urine by means of the polariscope. In such a case it could not have been determined with one instrument alone that any sugar was present; and in many cases, perhaps, the quantitative determination of the amount of sugar would be very much disturbed by the coincident presence of varying amounts of dextrose and levulose.

GLYCOSURIA.

F. Ehler¹ reports an interesting case of glycosuria which occurred in a woman of 32 years. The patient had had **repeated attacks of cholelithiasis**, which became associated with glycosuria, at well as with polydipsia and polyuria. Cholecystotomy was done, and a gallstone was removed from the cystic duct. The next day the sugar disappeared and did not return. Sheer believes that the cause of the glycosuria was **compression of the head of the pancreas** by the dilated gallbladder, which projected toward the left and backward.

H. Stern² discusses the occurrence of **diabetic and nondiabetic glycosuria** in the same individual, basing the distinction upon the presence in the cases of diabetic glycosuria of other symptoms of diabetes and the absence of such symptoms in cases of nondiabetic glycosuria. If the symptoms of diabetes disappear, leaving only glycosuria, Stern apparently makes upon this basis a diagnosis of nondiabetic glycosuria in the same individual. [In the present confused state of our knowledge concerning glycosuria and diabetes it is practically impossible to diagnose the coincidence of the two in the same individual.]

¹ Beiträge zur Path. der Glykosurie [casopis lekárie ceskych., 1903, p. 634]; Zeit. f. inn. Med., 1903, S. 1146.

² Amer. Med., Mar. 19, 1904.

beer entirely, because of its high content of purin-bodies; and should restrict, as far as possible, the use of peas, beans, onions, and asparagus.

Sir Dyce Duckworth,¹ in discussing the diet to be used in gouty and in goutily disposed persons, expresses himself as being strongly **averse to any routine methods of treatment** or routine restrictions in certain classes of food. Any excess in alcoholic drinks is universally bad, but he thinks that there are many patients who can wisely take a small amount of spirits with meals. **The diet must be arranged for the individual.** Rich, highly seasoned, greasy, or twice-cooked foods should always be excluded; and large amounts of animal and farinaceous food, fruit, wine, and food cooked with fat or sugar, as well as rhubarb, cooked tomatoes, and strong soups, are considered by him to be gout-provoking. The meals should consist of fresh food, plainly cooked, without much variety; because variety is likely to lead to excess. The patients should not, however, be greatly restricted in the use of either proteids or carbohydrates, unless there is a special, individual reason for it. Lemon-juice is often taken freely and is frequently very harmful. Large water-drinkers are often large eaters, thereby undoing the good effects of the free flushing.

DISEASES OF THE THYROID GLAND.

W. G. MacCallum² has made a study of the question of the production of **specific thyroid and parathyroid cytolytic serums**. He has been unable to determine that a specific serum can be produced by injection into another species. He was not able to produce a serum that destroyed the cells of the thyroid gland, but thought that probably he did produce a serum that united with the secretion of the parathyroid and produced **symptoms resembling those following the extirpation of the glands**. MacCallum then removed the parathyroid gland from a number of animals, the result being restlessness, muscular twitchings, and tetanic spasms, with a very marked increase of the respirations, but without any decided increase of the heart-action. **These symptoms may have been due to the absence of parathyroid secretion**, or to the absence of the neutralization of some poison produced elsewhere. In the latter case the poison may be produced in the intestine or in the course of metabolism. Some further experiments led MacCallum to the belief that the parathyroids probably do not produce the necessary secretion, but that they do neutralize poisons produced elsewhere. He believes that they have no influence upon nitrogen-metabolism, while this is markedly affected by the removal of the thyroid.

EXOPHTHALMIC GOITER.

P. Grocco³ discusses the **cardiac symptoms in Graves's disease**, particularly referring to the diagnosis. He finds that dilation of the

¹ Practitioner, July, 1903.

² Med. News, Oct. 31, 1903.

³ Riv. Crit. di Clin. Med., Jan. 2, 1904.

heart is always present in the attacks of tachycardia, even in the early stages. This is an important point of distinction from nervous tachycardia; since dilation does not occur in that condition, even after exertion. An **important characteristic of exophthalmic goiter** is the occurrence of rapid and marked but transitory changes in the size of the heart and in the heart-sounds. The cardiac symptoms in exophthalmic goiter can scarcely ever be considered to be entirely permanent. From actual cardiac disease due to other causes the cardiac symptoms in Graves's disease may be distinguished by the thyroid enlargement and the exophthalmos; or, if these are absent, by the prominence of tachycardia and by the appearance of the patient, which is usually one of terror with mental agitation or depression, or with an alternation of these two conditions. Chronic myocarditis is sometimes very difficult to exclude, but the **variable and transitory character of the heart-signs** in exophthalmic goiter is very important—particularly the rapid changes in the size of the heart and in the murmurs. It must be remembered that other forms of organic cardiac disease may complicate the heart-disturbance of Graves's disease.

L. Hofbauer¹ refers to the **disturbances of respiration** in exophthalmic goiter, to which he believes insufficient attention has been directed. He thinks that these are actually a direct result of the disease itself, and not merely a functional nervous manifestation. He describes some respiratory curves that he has taken with 4 patients. These tracings show flattening of the curve, lengthening of the inspiration and expiration, and irregularity in the individual elevations, with occasionally a more or less complete pause in breathing. One case in which there were frequent attacks of respiratory disturbance showed the breathing rapid in inspiration and expiration and respiratory pauses. In regard to these respiratory pauses, the author refers particularly to the observations of Fenyvessy, who produced a similar condition by the injection of thyroid substance.

A. W. Rogers,² in discussing the relation between **Graves's disease and the psychoses**, reviews 13 cases that he has observed, 10 of which were well-defined psychoses, the remaining 3 being pronounced neurasthenias. He agrees with other writers that there is no characteristic psychosis that occurs as a complication of Graves's disease, but he says that in over three-fourths of the cases types of mania are found. Cases associated with psychoses present no characteristic differences in their physical condition from those not so complicated. Pronounced psychic symptoms are only an exaggeration of the marked nervous symptoms that are always present; and, like Graves's disease itself, are **evidences of a general neurotic vice** in the individual. Graves's disease usually aggravates any mental trouble present, but apparently does not make the prognosis distinctly worse. Of Rogers's patients, 6 recovered entirely; 3 were greatly improved. All with neurasthenia recovered.

F. Bernard³ notes that while diarrhea is common in exophthalmic

¹ Mitth. a. d. Grenz. d. Med. u. d. Chir., Bd. xi, Heft 4.

² Medicine, Mar., 1904.

³ Presse méd., 1903, No. 41.

H. Luthje¹ has made an interesting study of the question **whether the power of destroying sugar is completely lost after extirpation of the pancreas.** He first refers to the fact that if dogs that have been subjected to pancreatectomy are allowed to starve, the sugar disappears gradually and often entirely from the urine. In such a case, after the sugar had disappeared, he determined the amount of sugar present in the blood, and found it to be 0.203 %. To his surprise, however, it was found, by making serial sections of the duodenum and of the neighboring peritoneum, that small remnants of pancreas were still present; although the operation had been carefully carried out and all the pancreas was thought to have been removed. To overcome this difficulty, he removed the entire duodenum with the pancreas from another animal; and in this case, after the disappearance of the sugar in the urine, he determined the blood-sugar and found it to be 0.312 %. He states positively that this dog, from which the pancreas had been completely removed, **had not entirely lost its sugar-destroying power.** He believes that the best explanation of this is probably that the sugar formed solely from the destruction of body-tissue is much more readily decomposed by the diabetic subject than is that from any other source, and thinks that this explains his results. That is, diabetic animals, when starved, ultimately come to a point at which they are living solely upon their own tissues; and, at this point, they are capable of decomposing all, or nearly all, the sugar that is formed. He believes that this explains the reduction of the glycosuria in cases of severe cachexia, such as that of carcinoma; and in some cases of nephritis, etc. The amount of nitrogen excreted in the urine of the dogs observed, he believes, supports this idea. [It seems wholly possible that, like birds, mammals destroy about as much sugar as the kidneys leave unexcreted, even after removal of the pancreas; but that mammals are much more sensitive to hyperglycemia than birds, and hence excrete a much larger portion of the sugar.]

J. E. Sweet² in a study of the bacteriolytic complement, has made the important observation that dogs which have been rendered diabetic by extirpating the pancreas show a very **marked decrease in the hemolytic activity** of the serum toward both rabbits' and guineapigs' erythrocytes, and also a **complete loss of the normal bactericidal power** of the serum. This apparently explains the marked tendency of diabetics to infections. The reduction in hemolytic activity is due to a loss of hemolytic complements. Probably the loss of bactericidal power is also due to the loss of the complement. The pancreas must be removed completely, in order to produce this loss of complements; but even after complete removal, the organism can react to inflammatory processes by an increase of the complements. Sweet believes that he has demonstrated that there is no relation between the leukocytes and the complement.

P. F. Richter³ has investigated the **influence of fever and of in-**

¹ Münch. med. Woch., Sept. 8, 1903.

² Jour. of Med. Research, Oct., 1903.

³ Berl. klin. Woch., Sept. 14, 1903.

fection upon the excretion of sugar, particularly their influence upon an adrenalin glycosuria. He finds that in the majority of cases when bacterial infection with streptococci is carried out, glycosuria does not appear after the use of adrenalin. He also finds that experimental fever, produced by the Sachs-Aronson puncture, has apparently little or no effect upon an adrenalin glycosuria. He therefore decides that **fever is without influence upon glycosuria, while bacterial infection has a decided effect** in decreasing the excretion of sugar. He thinks that we may definitely decide that the influence of infectious fevers in reducing sugar-excretion is due to the element of infection; while in cases in which the fever is little influenced we must decide either that the toxemia of the infection has been relatively slight, while the other elements in the case have been more severe; or else that different bacteria have different influences upon glycosuria.

W. Croner,¹ in discussing 100 cases of diabetes mellitus observed in a walking clinic, with particular reference to their **relation to tuberculosis and to arteriosclerosis**, reaches the conclusion that there apparently has been a **definite increase in the number of cases of diabetes**; and that there is a **distinct hereditary predisposition** to the disease. He refers to one instance in which a father acquired the disease in a mild form and the son afterward showed it in a severer form, and in which the history stated that the father's brother and two of this brother's sons had died of the disease. In relation to tuberculosis Croner discusses the views of others concerning the close association of this disease and diabetes, and then states his belief that the cause of this association is a hereditary predisposition that tends to develop either tuberculosis or diabetes in the same family or to develop both diseases in the same individuals. He thinks that the occurrence of diabetes in later life often indicates that the patients have had a predisposition to tuberculosis, but have escaped that disease and ultimately become diabetic. Of his 100 cases of diabetes, 47 patients were tuberculous or had tuberculous families; and 16 of the diabetics themselves had tuberculosis. He also thinks that arteriosclerosis frequently occurs in diabetics, because there is some primary factor that tends to produce both arteriosclerosis and diabetes. This, he believes, is, in many instances, alcoholism. He refers to the fact that of his 100 cases, 41 showed alcoholic excess. He believes that alcoholism does not produce diabetes if it is associated with hard physical labor, but that it tends to do so in persons of intellectual or sedentary habits. [Many of Croner's views are based almost entirely upon personal fancy and theory; and some of them are in opposition to facts quite thoroughly established.]

SYMPTOMATOLOGY AND COMPLICATIONS.

Teschemacher² has observed **Dupuytren's contracture** in **33 of 213 diabetics**. He thinks, therefore, that it is much more common in persons suffering with that disease than in persons in general. He

¹ Deut. med. Woch., Nov. 5, 1903.

² Deut. med. Woch., March 31, 1904.

attempted to determine why this is the case, and reached the conclusion that it is probably a trophoneurotic process. It is not due to local traumatic causes, because most of the patients were of the better classes. Gout was not the cause either, as distinct gout was present in only one case.

Martinet¹ reports an instance of **family diabetes**. A man, his wife, and his mother all exhibited diabetes under the observation of the author; while the father had previously died of the disease. Martinet considers that if diabetes is found in one or several members of a family, all the other members should be examined for the possible presence of the disease.

S. Hart and W. J. Gies² reports a case of **diabetes terminating in coma**, with a series of estimations of the amount of acetone, diacetic acid, betaoxybutyric acid, sugar, total nitrogen, and ammonia nitrogen. They found the ammonia nitrogen greatly increased as coma was approaching. Acetone was also markedly increased at this time; and there was a considerable, though variable, quantity of oxybutyric acid present. The patient had been on a restricted diet just before the onset of the coma. The authors emphasize the fact that to determine the ratio of the **ammonia nitrogen to the total nitrogen ratio is extremely important in prognosis**; and also that the use of carbohydrates may not be restricted with impunity, while in some cases a restriction of the fats and a continuance of the carbohydrates may be advantageous.

G. Parker³ reports a **case of bronzed diabetes** in a man of 65 years, who had recently developed the symptoms of diabetes and was found to have over 5 % of sugar. The skin had a dusky metallic hue, particularly in certain areas. The liver and the spleen were not palpable. The patient died in coma, and necropsy showed diffuse pigmentation of a brownish color in various tissues. The suprarenals were firm and somewhat darker than normal, but otherwise showed no changes. The liver was cirrhotic, much nodulated, and decidedly pigmented. The pancreas was small, firm, and pigmented. Even the cartilages of the ribs showed pigmentation, and many lymphatic glands were likewise pigmented. The granules of the liver showed a marked iron-reaction. The pigment in the pancreas also gave iron-reactions, and was deposited chiefly among the cells of the parenchyma. The spleen was fibroid. There was general arteriosclerosis. Parker agrees with the view that the chief factor in bronzed diabetes is a **loss of the power to eliminate blood-pigments**, rather than excessive hemolysis. He believes that the **diabetes is secondary**.

Fraser⁴ describes a **remarkable case of lipemia in a case of diabetes** occurring in a boy of 17 years. The case ended with coma. The lipemia was found several weeks before death, microscopic examination of the blood having shown innumerable fine granulations, which had a rapid oscillatory movement. After standing, they showed many small refractile droplets, which gave characteristic stains with osmic acid in Sudan

¹ La Presse méd., Feb. 10, 1904.

² Am. Jour. Med. Sci., Aug., 1903.

³ Brit. Med. Jour., Oct. 24, 1904.

⁴ Scottish Med. and Surg. Jour., Sept., 1903.

III. The retinal vessels had an opaque white appearance. Blood removed at autopsy showed a lower dark coagulum; above this, a creamy layer of fat; and over this, turbid serum. Large quantities of milky fluid were found in the serous cavities; and the vessels on the surface of the brain contained milky fluid, as did the vessels of the other organs. This fluid also gave characteristic stains for fat. Fatty degeneration was not marked in the tissues. Blood taken from the femoral artery showed 16.44 % of fat. The pleural exudate showed 18.94 %—an enormous increase over the normal, and over uncomplicated diabetes; only one case showing a higher percentage having been reported. The author considers it very important to recognize lipemia early. While the lipemia itself is not a source of great danger, and is not the cause of coma, it is probable that it depends upon the same factors as does the acidosis that produces the coma.

W. Hale White¹ reports a case of diabetes in which a lipemic condition of the blood was **recognized through examination of the retinal vessels**. He believes that lipemia is not extremely rare, as he has seen at least one other case, in Guy's Hospital, in which the condition was recognized by an examination of the retinal vessels. The arteries and veins contained blood, which was of a deep cream or pale salmon color. The patient was 26 years old; and although he had advanced to drowsiness and a fatal issue at one time seemed certain, he improved greatly. Under the microscope the blood showed many crystals, but no globules and nothing that stained with osmic acid. The drawn blood, however, was very milky; and the serum after clotting was milky.

E. Neisser and L. Derlin² report a case of diabetes with lipemia, the latter having occurred during diabetic coma. They made examinations of the fat, to determine whether it had the usual **characteristics of human fat**. They found that it practically agreed with the figures found by Erben for human chyle-fat. Apparently, then, it came from the food, and not from the tissues.

R. T. Williamson³ describes the **changes in the spinal cord** in a case of severe diabetes mellitus. The patient had had "symptoms of diabetic coma," but these had disappeared after the use of large doses of alkali. The knee-jerk and the tendo Achillis jerk were absent. Goll's column showed some degeneration, even macroscopically. Microscopic examination showed an excess of nuclei in Goll's column in the cervical region, and the nerve-fibers were diminished in size; though in a few instances they showed swollen axis-cylinders, and the myelin sheaths were sometimes distended. With Marchi's method, degenerated fibers were observed chiefly in the cervical region. A few degenerated fibers were found in Burdach's column. In a few sections the posterior roots showed degenerated fibers for a short distance just outside the pia mater. The changes described were probably secondary to the alterations in the blood and tissue-fluids. Williamson thinks that in

¹ Lancet, Oct. 10, 1903.

² Zeit. f. klin. Med., Bd. li, Hefte 5 u. 6.

³ Brit. Med. Jour., Jan. 16, 1904.

some cases the **loss of the tendon-reflexes in the legs is not due to disease of the nerves**, but to changes in the fibers in the posterior roots.

Treatment.—C. von Noorden¹ makes an interesting contribution concerning the **use of oats** in the treatment of severe diabetes mellitus. He refers to the fact that the use of carbohydrates in severe diabetes is sometimes, to one's surprise, followed by a reduction in the glycosuria, after strict dieting has been found ineffectual. Such results have been obtained with milk, which, of course, contains a considerable amount of sugar; and also with potatoes (Mossé). Such a treatment, however, can by no means be used with any freedom, as it sometimes results in much damage. A similar effect is that observed after the use of oats. The author especially insists that this treatment is by no means always successful, and that it **should be used with care in individual cases**; but that in some cases it seems to be sufficient to control—at times, completely—a diabetic glycosuria that has not previously been influenced by the most stringent diet. Ordinarily he uses Knorr's oatmeal or some similar preparation. This is boiled for a long time with water containing a little salt; and during the boiling butter and vegetable albumin are added. The author commonly employs "roborat," but one may, if desired, use egg-albumen instead, adding it after the oatmeal has cooled. The amount given during the day consisted of 250 grams of oats, 100 grams of albumin, and 300 grams of butter. Von Noorden describes a number of cases illustrating the influence of this diet upon the glycosuria; upon the excretion of acetone, nitrogen, and ammonia; and upon the body-weight. In the first case reported the influence was extremely satisfactory in all ways. In the second case a less satisfactory but still valuable influence was observed. The same is true of the third case. In the fourth practically no result was obtained. The excretion of sugar is not always indicative of the effect that this diet will have, for cases with a mild glycosuria do not always respond well; indeed, many mild cases bear this treatment badly. It is more valuable in the severe cases than in any others. The author believes that it is a more useful treatment than is the potato-cure, and that oats are probably better to use than any other carbohydrate, in a great proportion of the cases. [The remarkable differences in the response of different diabetics to different carbohydrates make it seem more than ever possible that we shall some day recognize in diagnosis as well as in therapeutics that the term "diabetes" includes numerous different abnormalities.]

J. Sawyer,² in referring to Mossé's observations concerning the **use of potatoes** in the diet of diabetics, states that he has had excellent results from this measure, and that he believes potatoes may be wisely used in various ways; for instance, in preparing bread, soups, etc.

L. Mohr³ contributes a discussion of sugar-production within the organism in diabetes mellitus, and demonstrates his belief that **various kinds of proteids have a decidedly different influence** upon the

¹ Berl. klin. Woch., Sept. 7, 1903.

² Brit. Med. Jour., March 5, 1904.

³ Zeit. f. klin. Med., Bd. lii, Hefte 3 u. 4.

excretion of sugar—a matter of considerable importance in dietetics. He also thinks that his investigations have demonstrated that it is highly probable that fats as well as proteids can be sources of sugar [a view that is yet far from being generally accepted].

Goliner¹ has used **levuretin**, a substance prepared from beer-yeast and containing its active principle, in the treatment of diabetes, giving three times daily a teaspoonful in water or soup. This causes the breaking-up of the carbohydrates in the gastrointestinal tract, but the patients are free from the distress of the complete or almost complete elimination of carbohydrates from their diet. The author finds that by this means it is possible to reduce the sugar-content of the urine, and to increase the body-weight, at the same time that the general condition improves decidedly, in spite of the fact that the diet is not restricted. [This treatment must necessarily be of only limited value and need care in its use.]

DIABETES INSIPIDUS.

K. Pichler² reports a case of diabetes insipidus in which there was a **diffuse ependymitis in the fourth ventricle**, which had caused obstruction of the aqueduct of Sylvius and internal hydrocephalus. During life the patient had shown no vertigo, headache, or paralyses of the cranial nerves, and the pulse had been of moderate frequency. The patient was weak at the time of his death, but death occurred with unexpected suddenness. Microscopic examination of the floor of the ventricle showed that there was infiltration with granulation-tissue and more or less formation of fibrous tissue. The similar cases that have been reported are briefly discussed.

Finkelnburg,³ in discussing immobility of the pupils in hereditary syphilis, describes a case of diabetes insipidus in which the only cerebral symptom that could be discovered was a **bilateral reflex immobility of the pupils**. There was no definite evidence of syphilis in the case. [Observations such as those of Pribram (YEAR BOOK, 1904) show that syphilis is by no means an essential consideration under such circumstances.]

L. Feilchenfeld⁴ reports a case of polyuria and one of typical diabetes insipidus in which he used **subcutaneous injections of strychnin** for a long time, with decided improvement of the condition, the excretion of urine being reduced from more than 4000 cc. to about 2500 cc.

A. Wolff⁵ reports a case of hereditary diabetes insipidus in which the excretion of urine was enormous, at times reaching as much as 11 liters. Treatment with opium, aspirin, and other drugs had been without effect, and Liebermeister recommended **secale** as an infusion (6:200), a tablespoonful of this being given two or three times a day. The amount of urine became rapidly reduced, and finally became as low as 1.5 to 2.5 liters. Immediately after the use of the drug the feeling of

¹ Therap. Monatshefte, Aug., 1903. ² Zeit. f. inn. Med.

³ Deut. Zeitsch. f. Nervenheilk., Bd. xxiii, Hefte 5.

⁴ Deut. med. Woch., 1903, No. 31. ⁵ Münch. med.

thirst disappeared and the patient began to put on weight. Some months subsequent to the beginning of the treatment the patient was still well. In another case the treatment caused a marked reduction in the excretion of urine, but the result was much less striking. The effect is perhaps produced through contraction of the vessels.

GOUT.

Nature and Etiology.—K. A. Krause¹ discusses the **origin of the urate-deposits in the tissues** in gout, referring to the various views held concerning this point and reporting his own studies of such deposits. He has never been able to find necrotic areas in the tissues without any deposition of crystals. Other authors have obtained the same result. He does not believe this to be due to the fact that small patches of necrosis have been overlooked, as many areas were examined; he thinks that it is merely begging the question to offer such an explanation. **He does not believe that necroses occur without uratic deposits.** He does not, however, think that this fact should be used as a definite argument against the truth of Ebstein's theory; for that author believes that the uric acid in solution causes the necrosis. It is quite possible, if this were true, that the uric acid would precipitate out at once when necrosis of the tissues occurs, the deposition and the necrosis being practically coincident. Krause finds that the peripheral, needle-like crystals are found almost regularly in normal tissue. There is sometimes noticeable in this tissue a poor staining of the nuclei. The author believes this to be due entirely to some pressure-atrophy. He has never seen deposits like those described by Ebstein, in which there was a central mass of crystals surrounded by a zone of necrotic tissue. He has, on the contrary, repeatedly noticed that in small deposits the crystals seem merely to push the tissue-elements aside, the cells remaining of quite normal appearance. He thinks that his studies have given no ground for the belief that a tissue-necrosis precedes the deposition of crystals, and he has **great doubt as to whether these so-called necroses are actually such.** The so-called necrotic areas have not the characteristics of ordinary necrosis; they have none of the remnants of tissue-structure ordinarily present, and Krause concludes that the so-called necrotic areas are really the remnants of the substances in which the uric-acid crystals have been embedded and inclosed. It is quite possible that some of the tissue-elements are destroyed and help to form the granular mass. This, however, does not constitute necrosis in its true sense. [This work has evident importance as against the view that uric acid is the chief factor in causing gout.]

C. Watson² reports the conditions found in a case of **typical gout in a cock.** This bird was a year old at the time of its death, which occurred rather suddenly. The conditions found in the pancreas and the kidney were such as to lead the author to think them due to a bacterial infection. He believes that it is important to determine whether in human gout

¹ Zeit. f. klin. Med., Bd. 1, Hefte 1 u. 2.

² Brit. Med. Jour., Jan. 9, 1904.

there is an **evidence of infection**; as, in his opinion, this would more satisfactorily explain the conditions in that disease than does any other theory that has been advanced.

M. Kochmann¹ has studied in 3 dogs the **effect of prolonged feeding with meat** that was free from tendon, bone, and fat. The animals showed no disturbance of health except albuminuria. Postmortem examination revealed marked lesions in the liver and the kidneys, the latter exhibiting cloudy swelling and even actual nephritis. The author believes that these changes are sufficient to interfere with the proper breaking-down of uric acid in the body to produce an excess of uric acid in the system, and so to lead to gout. The use of alcohol and intoxications with metals act in the same way. Animals that were given carbohydrate with their meat for the same length of time did not exhibit these changes. Kochmann thinks it possible that the meat-diet caused a **chronic acid-intoxication**.

Grossmann² has studied 3 cases of gout, using the same food throughout and administering a **diet practically free from purin-bodies**. The patients received 2 liters of milk, 4 eggs, 80 grams of butter, 2 schrippen, and 250 grams of bread. He found that the values in uric acid were not greater and, indeed, were rather less than those in normal persons, but that they were nearly the same as the normal figures. The amount of indican was increased in but one case, and in this it was apparently not due to the gout, but to another cause.

T. B. Fletcher³ discusses the **relation between uric-acid and phosphoric-acid** excretion in the intervals of gout and during acute attacks of that disease. He directs attention to the close relationship in the excretion of these two substances in the cases that he reports, and thinks that both are products of nuclein-disintegration. In the interval, uric acid and phosphoric acid are both reduced much below normal. Two or three days after the acute symptoms begin, both phosphoric and uric acid gradually increase, until they reach the average of normal or its upper limit. As the acute symptoms subside, both fall to below normal. The author considers the **low uric-acid output important in the diagnosis** of gout in the interval.

S. West,⁴ in discussing the **relation between gout and granular kidney**, notes that in true gout he has often seen a severe, transitory albuminuria; but that this disappeared rapidly. The association of actual acute nephritis with gout is rare, and patients with acute nephritis do not develop symptoms of gout. He thinks that the association between actual acute nephritis and gout is merely accidental, when it occurs. He states that many persons have gout all their lives, and yet die with healthy kidneys; and that, on the other hand, many have granular kidney and never have gout. He believes that any relation between gout and granular kidney is not constant or essential. Lead-poisoning not infrequently causes gout, and yet, in his opinion, lead-poisoning does not produce granular kidney. The real relation between

¹ Pflüger's Archiv, Bd. xciv, p. 593.

² Berl. klin. Woch., 1903, No. 24.

³ Practitioner, Aug., 1903.

⁴ Practitioner, July, 1903.

lead-poisoning and gout, on the one hand, and granular kidney, on the other, is, he thinks, that persons with damaged kidneys **show the effects of lead-poisoning or develop gout much more readily** and more severely than do those that have normal kidneys.

Falkenstein¹ believes that gout is due to some **disease of the HCl-producing glands of the stomach**. He bases this conclusion very largely upon the observation that certain cases of gout improve upon large doses of HCl, and largely, also, upon purely theoretic reflections. [A very fanciful idea.]

Symptomatology.—S. Toogood² discusses **gout as it occurs among the poor** and is seen in institutions. He states that it is much more common among men than among women, chiefly because the former use alcohol much more freely than do the latter; and because women, when they are habitual drinkers, use spirits. Women are, however, rarely seen in institutions until they become nearly helpless from the disease. Occupation seems to have very little influence; and even at the time of the onset of the disease it seems to have but little influence upon the joint involved. The great toe is usually affected, even in patients that use their hands excessively. Walking for unaccustomed distances, however, certainly induces attacks; and when the disease has once developed, the **nature of the occupation does to some extent determine** the special joints involved. For instance, cobblers are very likely to have the little finger of the left hand affected, because it is subjected to great strain. The **consumption of malt liquor is**, Toogood thinks, the chief, if not the only, cause of gout among the poor. He has never seen a case in which the knees or the joints of the upper extremity were the primary seat of the disease; and it is only rarely that the disease does not begin in the metatarsophalangeal joint of the great toe. After it has once commenced, however, the author has repeatedly seen it confine itself to the wrists and the fingers. Even when tophi are present about the joints, they are often not found in the ear-cartilages. He has never seen a stiff joint regain its movement. In advanced cases the wrists and ankles may feel as if encased in a subcutaneous coating of plaster-of-Paris, particularly when tophi are absent. Toogood has made a series of **examinations of patients dying of chronic kidney-disease**; in a considerable proportion, even when antecedent gout was absent, he found crystals of sodium urate in the joints. He has repeatedly seen acute inflammation of joints, chiefly involving the ankle and wrist, in persons dying of wasting disease; and in every case examined he has in such instances found sodium urate in the cartilages and in the synovial fluid, gout being absent in all these cases. He is convinced of the truth of the lay statement that chronic leg-ulcers grow worse as arthritic symptoms subside, and vice versa. He does not think that there is any such thing as actual gouty urethritis. In institution-patients he has had no experience with so-called retrocedent gout. He has, however, seen parotitis. He considers the **chief point in diagnosis** to be that the deformity is in the fibrous structures around the joints, the joint-surfaces

¹ Berl. klin. Woch., Jan. 18, 1904.

² Practitioner, July, 1903.

themselves being uninvolved. The history of the mode of onset is the safest guide, however. Gout and arthritis deformans may be seen in the same person, and the author mentions an autopsy on a person who had had typical gout, the autopsy showing the early stage of arthritis deformans. In the great-toe joints there were also deposits of sodium urate. In long-standing cases of gout the joints look as if they had been white-washed. True fibrous ankylosis does not occur. Toogood states that acute attacks do not occur when the patients are settled down in the infirm-wards, where the rules require that malt liquors be entirely withheld. The joint-pains in chronic cases are relieved by **sulfur and guaiac**, or by the combined use of balsam of sulfur and turpentine. The only application that he has found useful is hot brine fomentations.

A. Crombie,¹ in discussing **gout in the tropics**, states that he has seen many cases among Europeans, Jews, and well-to-do natives of Calcutta. The disease is, however, **much less frequent** in India, and probably also in other hot climates, than it is in Europe. It is rarely seen in hospital practice in India. Irregular manifestations of gout are, however, quite common, the author thinks, in Europeans who have been exhausted by long residence in a hot climate and have indulged their appetites freely. The infrequency of gout in the tropics, in his opinion, is largely explainable through the lower tissue-metabolism required in such regions to maintain the temperature of the body. Among natives, it is largely due to the fact that **relatively little nitrogenous food** is used. In Europeans, it is not due to differences in the diet; for they live in the tropics much as they do at home. Diabetes is very common in well-to-do natives.

T. B. Fletcher,² in a further general discussion of **gout in the United States**, says that the cases of gout seen in the Johns Hopkins Hospital up to the time of writing have increased to 42, all being in men, one of whom was colored. Albuminuria was observed in 32 cases; hyaline or granular casts in 26; 39 had reached the chronic stage before having been seen; 19 showed tophi.

A. A. Getman and R. W. Amidon³ report a case of what they term **gouty phlebitis** in a woman of 39 years whose father had had phlebitis shortly before his death, and whose aunt had died of senile gangrene. This patient, after a fall, developed the signs of right saphenous phlebitis, which showed improvement and exacerbation lasting for months. Toward the latter part of the disease many veins displayed the condition that has been termed by Paget "metastatic phlebitis," various small veins showing signs of acute inflammation. At this time the patient had had the first frank gouty manifestation, which consisted in inflammation of the metatarsophalangeal joint of the left great toe.

Treatment.—J. W. Hall⁴ has made a study of **vegetable foods of various kinds**, in order to determine the amount of purin-bodies in them—particularly with reference to the use of these substances in gout and nephritis. He thinks that his results indicate that one should exclude

¹ Practitioner, July, 1903.

² Med. Rec., July 25, 1903.

³ Practitioner, July, 1903.

⁴ Berl. klin. Woch., Sept. 21, 1903.

beer entirely, because of its high content of purin-bodies; and should restrict, as far as possible, the use of peas, beans, onions, and asparagus.

Sir Dyce Duckworth,¹ in discussing the diet to be used in gouty and in goutily disposed persons, expresses himself as being strongly **averse to any routine methods of treatment** or routine restrictions in certain classes of food. Any excess in alcoholic drinks is universally bad, but he thinks that there are many patients who can wisely take a small amount of spirits with meals. **The diet must be arranged for the individual.** Rich, highly seasoned, greasy, or twice-cooked foods should always be excluded; and large amounts of animal and farinaceous food, fruit, wine, and food cooked with fat or sugar, as well as rhubarb, cooked tomatoes, and strong soups, are considered by him to be gout-provoking. The meals should consist of fresh food, plainly cooked, without much variety; because variety is likely to lead to excess. The patients should not, however, be greatly restricted in the use of either proteids or carbohydrates, unless there is a special, individual reason for it. Lemon-juice is often taken freely and is frequently very harmful. Large water-drinkers are often large eaters, thereby undoing the good effects of the free flushing.

DISEASES OF THE THYROID GLAND.

W. G. MacCallum² has made a study of the question of the production of **specific thyroid and parathyroid cytolytic serums**. He has been unable to determine that a specific serum can be produced by injection into another species. He was not able to produce a serum that destroyed the cells of the thyroid gland, but thought that probably he did produce a serum that united with the secretion of the parathyroid and produced **symptoms resembling those following the extirpation of the glands**. MacCallum then removed the parathyroid gland from a number of animals, the result being restlessness, muscular twitchings, and tetanic spasms, with a very marked increase of the respirations, but without any decided increase of the heart-action. **These symptoms may have been due to the absence of parathyroid secretion**, or to the absence of the neutralization of some poison produced elsewhere. In the latter case the poison may be produced in the intestine or in the course of metabolism. Some further experiments led MacCallum to the belief that the parathyroids probably do not produce the necessary secretion, but that they do neutralize poisons produced elsewhere. He believes that they have no influence upon nitrogen-metabolism, while this is markedly affected by the removal of the thyroid.

EXOPHTHALMIC GOITER.

P. Grocco³ discusses the **cardiac symptoms in Graves's disease**, particularly referring to the diagnosis. He finds that dilation of the

¹ Practitioner, July, 1903.

² Med. News, Oct. 31, 1903.

³ Riv. Crit. di Clin. Med., Jan. 2, 1904.

heart is always present in the attacks of tachycardia, even in the early stages. This is an important point of distinction from nervous tachycardia; since dilation does not occur in that condition, even after exertion. An **important characteristic of exophthalmic goiter** is the occurrence of rapid and marked but transitory changes in the size of the heart and in the heart-sounds. The cardiac symptoms in exophthalmic goiter can scarcely ever be considered to be entirely permanent. From actual cardiac disease due to other causes the cardiac symptoms in Graves's disease may be distinguished by the thyroid enlargement and the exophthalmos; or, if these are absent, by the prominence of tachycardia and by the appearance of the patient, which is usually one of terror with mental agitation or depression, or with an alternation of these two conditions. Chronic myocarditis is sometimes very difficult to exclude, but the **variable and transitory character of the heart-signs** in exophthalmic goiter is very important—particularly the rapid changes in the size of the heart and in the murmurs. It must be remembered that other forms of organic cardiac disease may complicate the heart-disturbance of Graves's disease.

L. Hofbauer¹ refers to the **disturbances of respiration** in exophthalmic goiter, to which he believes insufficient attention has been directed. He thinks that these are actually a direct result of the disease itself, and not merely a functional nervous manifestation. He describes some respiratory curves that he has taken with 4 patients. These tracings show flattening of the curve, lengthening of the inspiration and expiration, and irregularity in the individual elevations, with occasionally a more or less complete pause in breathing. One case in which there were frequent attacks of respiratory disturbance showed the breathing rapid in inspiration and expiration and respiratory pauses. In regard to these respiratory pauses, the author refers particularly to the observations of Fenyvessy, who produced a similar condition by the injection of thyroid substance.

A. W. Rogers,² in discussing the relation between **Graves's disease and the psychoses**, reviews 13 cases that he has observed, 10 of which were well-defined psychoses, the remaining 3 being pronounced neurasthenias. He agrees with other writers that there is no characteristic psychosis that occurs as a complication of Graves's disease, but he says that in over three-fourths of the cases types of mania are found. Cases associated with psychoses present no characteristic differences in their physical condition from those not so complicated. Pronounced psychic symptoms are only an exaggeration of the marked nervous symptoms that are always present; and, like Graves's disease itself, are **evidences of a general neurotic vice** in the individual. Graves's disease usually aggravates any mental trouble present, but apparently does not make the prognosis distinctly worse. Of Rogers's patients, 6 recovered entirely; 3 were greatly improved. All with neurasthenia recovered.

F. Bernard³ notes that while diarrhea is common in exophthalmic

¹ Mitth. a. d. Grenz. d. Med. u. d. Chir., Bd. xi, Heft 4.

² Medicine, Mar., 1904.

³ Presse méd., 1903, No. 41.

goiter, **mucomembranous enterocolitis** is uncommon. He describes 5 cases of the latter condition complicating exophthalmic goiter. All occurred in women, of whom 4 had enteroptosis or nephroptosis, and 3 of whom had passed intestinal sand. One patient had diarrhea; the others, constipation. The author considers mucomembranous enterocolitis to be merely a symptom, and refers it to a disorder of the abdominal sympathetic.

MYXEDEMA.

A. Magnus-Levy¹ presents an important and extensive study of a large series of cases of myxedema of adults, sporadic cretinism, cachexia strumipriva, and epidemic cretinism. Among his points concerning **myxedema of adults** is the fact that the patients came from a region in which goiter and endemic cretinism are rare. **Acute infectious diseases often appeared to be the cause** of the onset of the myxedema. In one case it directly followed a severe hemorrhage. He found no evidence that tuberculosis was important in producing the myxedema; he also did not find the swelling of the skin distributed so extensively over the body as is usually described, affecting chiefly the head and face; and subcutaneous tumor-formations were rare. Of the internal organs, the heart was the most commonly affected, frequently showing enlargement and murmurs. In only one case was there a glycosuria, and that was temporary. Contrary to some authors, he finds that metrorrhagia and menorrhagia are not constant occurrences in women. **Severe mental disturbance is less common** than the usual descriptions indicate, but he particularly notes that the patients often react to sharp intellectual stimulus very readily; so that any slight intellectual disturbance present may readily be overlooked. Nine cases were treated with thyroid, 3 being cured within a few weeks, and one after the greater part of a year. Two showed much improvement after a long time. Two after a short treatment showed doubtful results; but after prolonged treatment got entirely well. In one case the cure was persistent after 5 years, the treatment having been continued for only one year. In discussing **sporadic cretinism** he notes that the two sexes are about equally affected. He believes that the so-called **myxedema of children is really a mild cretinism**. He especially insists upon the importance of these mild cases, and particularly notes that in endemic cretinism the results of treatment, if such mild cases are included, are much more satisfactory than is generally considered. The very advanced and prolonged cases do not show any noteworthy improvement, but the less severe and less prolonged ones do react to treatment. He finds that myxedematous changes in the skin do occur in epidemic cretinism, although they are often localized, particularly about the head. He believes that all these classes of cases are related to each other in the fact that they show disturbance of the thyroid gland. He also presents an interesting **discussion of the various thyroid preparations** in the

¹ Zeit. f. klin. Med., Bd. lli, Hefte 3 u. 4.

treatment of these conditions, deciding that they are about equal in their effect, and that Oswald's iodine-containing albumin-body is certainly the active principle of the thyroid gland. He has likewise made interesting and extensive **studies of the gas-interchange** in respiration, and finds that in the severe cases there is a decided reduction in the intake of oxygen and the excretion of CO_2 , as compared with a normal person. This is not due to the smaller amount of functioning protoplasm, but to the **reduced vital energy of the patient**. The influence of thyroid treatment was to increase the gaseous interchange. This is in very interesting contrast to the conditions in exophthalmic goiter, in which the gaseous interchange is tremendously increased over the normal.

ADDISON'S DISEASE.

Wiesel¹ describes a case of Addison's disease in a boy 15 years of age in which there was **complete destruction of the chromatin system**, including that in the suprarenals. In another patient with bilateral tuberculosis of the suprarenals without Addison's disease microscopic examination showed that both the suprarenal glands were entirely destroyed, with the exception of slight remnants of the cortex. In the large ganglions of the abdominal plexus the author found many large chromatin bodies, some of which were visible even macroscopically. These were so large as to indicate that they had hypertrophied in compensation for the loss of the suprarenals.

E. W. Adams² has made a collective investigation of the **results of organotherapy** in Addison's disease, including 97 cases in these statistics. He thinks that some cases derive benefit from this treatment, although it is impossible, at present, to state beforehand which cases are likely to be benefited. The use of the treatment is, therefore, **somewhat haphazard**, and disappointment is likely to follow; but it seems to offer better chances of success than any alternative method. The preparations that have been used are certainly satisfactory as a usual thing; and it will, perhaps, be possible to discover one more satisfactory.

Boinet³ discusses **suprarenal therapy** in Addison's disease, reporting a case in which, after 220 subcutaneous injections, there was great improvement, and 5 cases in which there was some. He also refers to the **occasional danger** in the use of adrenalin in these cases, and illustrates this danger by reporting 2 cases in which fatality occurred soon after instituting its use. [Boinet is apparently not very strict in his methods of diagnosing Addison's disease.]

ARTHRITIS DEFORMANS.

D. L. Edsall and R. S. Lavenson⁴ discuss the **nature of certain cases of chronic polyarthritis**, referring particularly to their obser-

¹ Zent. f. inn. Med., Jan. 9, 1904, p. 35.

² Practitioner, Oct., 1903.

³ Bull. de l'Acad. de Méd., Dec. 1, 1903.

⁴ Am. Jour. Med. Sci., Dec., 1903.

vations concerning the occurrence of tuberculin-reactions in 18 cases of chronic polyarthritis. Of these, 8 gave no reaction; 3, a doubtful reaction; and 7, a distinct reaction. Of the 8 that did not react, 6 were arthritis deformans; but most of these were very old cases. Of the 3 that gave a doubtful reaction, all were of the type of chronic rheumatism. Of the 7 that gave a distinct reaction, 4 were arthritis deformans; 2, chronic fibrous rheumatism; and 1, an instance of Still's type of chronic polyarthritis. In the latter case there was a violent local reaction in the joints. Some of the glands were removed and shown to contain a great number of bacilli having the characteristics of tubercle bacilli. These bacilli did not, however, produce tuberculosis in guineapigs; they were probably, therefore, dead. In this case the general course of the disease of the glands and of the joints, together with the presence of bacilli in the glands and the violent tuberculin-reactions, led the authors to decide that the **condition was probably one of chronic widespread tuberculosis** of extremely low virulence. The effect of tuberculin was interesting in only 3 of the other cases; but was decidedly so in these, on account of the marked local symptoms produced. While the effects of tuberculin are in many respects inconclusive, the authors believe that their observations indicate that in a certain number of instances the teaching of Poncet, that chronic polyarthritis is at times tuberculous, may be correct.

W. G. Erving¹ reports some observations on the condition of the **blood in rheumatoid arthritis** and in osteoarthritis, 40 cases having been studied. His results are not in accordance with the usual statement that there is anemia with leukocytosis. The cases that he observed were all in active stages of the disease, showing either the acute symptoms of the onset or an exacerbation of these symptoms, occurring months or years after the first attack. In rheumatoid arthritis the lowest red count was 4,148,000; the average was 5,112,000. The lowest hemoglobin was 80 %, the average being 94 %. The highest leukocyte-count was 15,800; the average, 8885. In osteoarthritis the lowest red count was 4,024,000; the average, 7,310,000. The lowest hemoglobin was 70 %; and the average, 94.5 %. The highest leukocyte-count was 12,800; the average, 9175. The red count, therefore, was somewhat above normal; and the hemoglobin ran close to 100 (the Talqvist scale was used). This was the case not only with robust, healthy men, with acute symptoms of a few weeks' standing, but also with those that had suffered for some time, and had more or less general involvement. The slight leukocytosis present in most of the cases showed no relation to the duration of the disease. The differential leukocyte-count showed some decrease of the polymorphonuclears, and a consequent increase of the mononuclear elements, in rheumatoid arthritis; but this was not striking. There were no abnormal elements in the blood, and no signs of degeneration. There is, therefore, a **decided difference between the clinical appearances and the blood-findings.**

¹ Amer. Med., Sept. 12, 1903.

T. McCrae¹ discusses, from a statistical standpoint, **110 cases of arthritis deformans**. He divides these cases into a group with Heberden's nodes; a polyarticular form, excluding the spondylitis group; a monarticular form; and spondylitis. He refers to the small number of colored patients with this condition. There was no definite evidence that the disease develops earlier in those with a family history of arthritis. Gonorrhea was recorded in the history in only 14 cases. McCrae particularly refers to the fact that the **onset is often acute**; and that, in this point and in the fact that it is polyarticular, it may resemble acute rheumatism. McCrae particularly notes that the joints were not involved with a symmetry that was at all accurate. The condition of the heart was noted in 74 cases. In 7 of those there were organic lesions; in 10, murmurs not organic; and in 2, irregularity. In two-thirds of the cases the pulse-rate was about 90—a symptom that McCrae believes to be of importance in the diagnosis. Of 33 cases carefully examined, 13 showed general glandular enlargement and 4 showed enlargement of some of the glands. In 4 of 39 cases noted, the spleen was enlarged. Seven cases showed **subcutaneous fibroid nodules**—a much larger percentage than was noted in rheumatism; and the patients with nodules were all over 25 years of age. Pigmentation he believes to be not especially frequent in this disease. The blood shows less anemia than the pallor of the patients indicates. The reflexes were found variable. **Cultures were entirely negative**. One case came to autopsy, but provided comparatively little information. The lesions spoke for inflammatory rather than for degenerative change. McCrae particularly refers to the **diagnosis from acute articular rheumatism**, mentioning the fact that the disease does not shift from joint to joint, and that a joint once attacked usually does not clear up rapidly. There is not much redness, and the swelling is generally more marked in the surrounding structures than in the joint itself. The joints of the neck and the temporomaxillary joints are often involved, while this is rare in rheumatism. The temperature is not very high. The pulse is usually rapid, even during convalescence. An enlargement of the lymph-glands speaks for arthritis deformans, and marked atrophy also indicates this disease. The cases of spondylitis are divided into those with local and those with general involvement. The former are, in many instances, particularly difficult to diagnose in the early stage. McCrae insists that the osteoarthritic type and the rheumatoid type are not infrequently seen together in the same patient. The author notes that tuberculin is valuable in the diagnosis from tuberculous spondylitis. He particularly emphasizes the importance of carefully examining the back in cases resembling sciatica or those with pain and discomfort in the back. A light plaster-jacket is very valuable in determining the diagnosis, as well as in the treatment.

E. Barg² discusses **muscular rigidity of the spinal column** [rigiditas dorsalis myopathica (Senator)]. This class of cases has recently been

¹ Jour. Am. Med. Assoc., Jan. 2, 9, and 16, 1904.

² Zeit. f. klin. Med., Bd. 1, Hefte 3 u. 4.

referred to by Senator, who insists upon the importance of recognizing the primary muscular origin of the condition; since these cases are much more readily subject to improvement by means of therapy in the early stages than the cases with bone-changes. Further, if they are not recognized early, they are likely ultimately to produce changes in the bones and ligaments. When this happens, they have passed the point at which they are readily subject to improvement. Barg believes that the cases of spinal rigidity that have recently given rise to so much discussion may be best divided into **a myogenous and an osteoarthrogenous group**. He reports the case of a man of 50 years whose history had been of practically no consequence until the time of the accident that brought on his trouble. At this time he fell about 8 feet, striking upon his head and back. He remained unconscious for a short time, and then went to work again; but he had pain in the back and head and stiffness of the back, which increased from moment to moment. His symptoms grew worse for some time, and then gradually improved a little, so that he was fairly comfortable when quiet. He was not able to work afterward, however. When examined, he showed extreme stiffness of the neck, back, and hips. The absence of any disease of the spinal column or of the nerve-roots was indicated by the fact that the electric reactions of the muscles were practically normal; that an x-ray picture showed no evidence of disease; and that passive movements could be made in a perfectly normal manner under anesthesia. The patient was treated with potassium bromid, massage, warm baths, and passive movements, and improved. It was also noted that after anesthesia he could carry out movements with much greater readiness for some time, and that there was a distinct permanent improvement after having been anesthetized. The cases of similar kind are abstracted and it is recommended strongly that in such cases **radiography and anesthesia** be used as methods of examination. A similar case reported by Strauss is referred to, in which lumbar puncture resulted in the withdrawing of a considerable amount of dark, tarry fluid. In the case here reported lumbar puncture was carried out, but without any striking result. In Strauss's case it was immediately followed by rapid improvement and practical recovery. It is probable that in many of these cases the actual condition present is a subarachnoid hemorrhage.

P. Jacob,¹ in the discussion of Senator's case of muscular rigidity of the spinal column, refers to a similar case observed by himself, in which there was a remarkable degree of **myasthenia combined with spinal rigidity**, which, from the Röntgen-ray and other examination, appeared to be due to rigidity of the muscles. The combination of this with myasthenia has not, he thinks, been previously described. The patient developed the most profound weakness after having taken a few steps. Treatment by extension, gymnastic movements, and baths caused pronounced improvement.

J. Ruhräh² reports a marked case of **spondylitis deformans** in a

¹ Berl. klin. Woch., Aug. 10, 1903, p. 746.

² Am. Jour. Med. Sci., Nov., 1903.

woman of 22, and gives an interesting general discussion of the condition with extensive references to the literature bearing upon it.

OSTEITIS DEFORMANS.

H. J. Sommer¹ reports a case of osteitis deformans that occurred in a man 63 years of age, a bookbinder by occupation. The first symptoms probably appeared in 1885, when the patient became stoop-shouldered and bow-legged, and had pains in his legs. In 1891, a year after sustaining a fracture of the thigh, it was noticed that his head was enlarging and that he was becoming melancholy. His hearing had become defective a year previously, and the following year he became very deaf and absolutely helpless. A detailed description of the case is given, which is a typical one of osteitis deformans, involving most markedly the lower extremities. The disease lasted 18 years before death. The **condition of the ribs was very remarkable**, apposition being so great as practically to obliterate the intercostal spaces and cause the ribs to look and feel like a large flat bone with corrugations.

W. J. Kilner² reports 2 cases of osteitis deformans that are chiefly interesting because they **occurred in a brother and sister**, that of the woman being typical. The case of the man showed no enlargement of the cranial bones, but was otherwise typical. The author has been able to find no other record of the occurrence of the disease in 2 members of the same family. In these instances it began almost simultaneously in the 2 patients. They had, however, lived apart for many years, and had not been subjected to the same conditions of life. At the time of the report the woman was 69 years old; the man, 60.

C. J. Foote³ reports a case of osteitis deformans **complicated with a marked cardiac lesion** with enlargement of the liver and spleen.

MISCELLANEOUS METABOLIC AFFECTIONS.

Chronic Rheumatism.—J. Weiss⁴ describes some clinical observations that he has made in cases that he classes as chronic rheumatism. The changes to which he particularly refers are not situated in the joints, but in the **muscles and subcutaneous connective tissue** near the joints. He has, in all, seen about 100 such cases. The chief complaint was pain, sometimes in the lower and sometimes in the upper extremities, the pain often being at definitely localized points. The joints were found nearly or quite normal; but the muscles, subcutaneous tissue, and adipose tissue were, at definite points, very tender, and upon careful palpation showed at these points a definite thickening or infiltration. Sometimes this was nodular; sometimes, diffuse. The neighborhood of the knee, at the lower third of the inner side of the quadriceps, is the most common point, or a similar spot below the knee; also, the inner side of

¹ Amer. Med., Aug. 8, 1903.

² Am. Jour. Med. Sci., Nov., 1903.

³ Zent. f. inn. Med., May 7, 1904.

⁴ Lancet, Jan. 23 1904.

the muscles near the elbow. Frequently the point of insertion of the deltoid or the region of the supraspinatus is affected. Weiss has also observed these points in the back and front of the neck. They are common along the shinbone. Patients will themselves often definitely localize these points. Weiss has had no opportunity to study the pathologic nature of this condition. He thinks that it most closely **approaches the subcutaneous fibrous nodules** described by Fagge. A more extensive description will follow.

Polymyositis.—W. Streng¹ reports the case of a man of 63, who had polymyositis of severe onset, resembling rheumatism or grip. On account of the evidences of inflammation of the muscles with edema over them, and also because of eczema of the skin and inflammation of the mucous membrane of the mouth, the diagnosis of polymyositis was made during life. Postmortem examination confirmed this and showed profound changes in the muscles, the fibers having become homogeneous, swollen, and fragmented. The interstitial tissues also showed extremely marked changes. The diaphragm showed changes quite as marked as those of the muscles of the extremities. A similar case, which was probably also polymyositis, is reported. It occurred in a man of 63 years.

HYPERTROPHIC OSTEOARTHROPATHY.

W. H. Wynn² reports 2 cases of secondary hypertrophic osteoarthropathy and gives a general discussion of the condition, based upon a study of literature, in which he finds 100 cases that he considers typical. His own cases **bring the total up to 102**, and he has found 30 other cases that are doubtful or atypic. He insists upon the importance of the **rôle that acute diseases seem to play** in producing the condition, it being by no means necessarily dependent upon tuberculosis or other chronic disease. He thinks that the condition is partly due to congestion. In 3 instances in which he found club-fingers, most of the enlargement was due to increase of fat; and he believes clubbing to be merely one stage in the condition termed osteoarthropathy.

T. C. Janeway³ reports 2 cases of hypertrophic osteoarthropathy and discusses various points in relation to the condition. Both patients had bronchiectatic cavities. Janeway thinks that **club-fingers should be included in the same group** as Marie's hypertrophic pulmonary osteoarthropathy, and that the two conditions should be classed as different stages of the same process, until more definite knowledge to the contrary has been reached. He believes it to be very important to record radiographic observations at different stages of the disease in cases of this kind. He has collected all the cases in medical literature up to January 1, 1903. So far as he considers them authentic, they number 93. These are arranged so as to be referred at once to their original source. Sixty-five show association with chronic disease of the lung or

¹ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

² Birmingham Med. Review, Mar. and Apr., 1904.

³ Am. Jour. Med. Sci., Oct., 1903.

pleura; there were 19 associated with other diseases; 5 showed no preceding cause; and 9 were not definitely proved to be secondary, but showed subsequent disease. Twenty-eight cases were found without enlargement of the long bones. A considerable number were also associated with suppurative, gangrenous, or putrefactive processes. Janeway leans to Bamberger's original theory of a **toxic cause**; but he thinks that more stress must be laid upon local circulatory conditions than has usually been done. He considers this an important accessory cause, even in the advanced cases associated with marked pulmonary conditions. The cause of the apparently primary cases is entirely obscure.

POLYARTHRITIS WITH PSORIASIS.

C. Adrian¹ describes a form of polyarticular disease associated with psoriasis that he believes to be a peculiar and special condition. It is distinguished by its association with psoriasis, its very chronic course, and its lack of tendency to cardiac complications; and by the fact that it is not influenced by the salicylates, and that it often produces early deformities of the joints and gradually proceeds to their destruction. He has found **94 such cases recorded in literature**. The cause of the disease of the joints is quite as obscure as is the cause of psoriasis. Men are more frequently affected than women, contrary to the conditions in arthritis deformans. He has been unable to determine that there is any relation to disease of the nervous system, to gout, to gonorrhea, or to syphilis.

POLYARTHRITIS WITH HEMORRHAGES.

T. K. Munro and A. N. McGregor² report a very interesting case which they **consider a chronic neurosis**, its chief characteristics being frequent paroxysms of pain, swelling, and hemorrhage in various parts of the body; in the early stages, particularly, involving the joints. The whole course of the condition lasted several years, and the patient finally died of acute pulmonary tuberculosis. Blood-cultures during life and bacterial study postmortem showed no evidence of infection. ³ There was no leukocytosis. It was decided that the condition was a neurosis, and its relation to the visceral manifestations of the erythema-group, to angioneurotic edema, and to the purpuric affections is noted. This patient was the subject of factitious urticaria.

INTERMITTENT HYDRARTHROSIS.

Wiesinger³ reports a case of intermittent hydrarthrosis affecting both knee-joints. It occurred in a man 40 years of age. The left knee-joint had become swollen about every 10 days for 5 years, being entirely normal during the periods between the swellings. The swelling was

¹ Mitth. a. d. Grenz. d. Med. u. d. Chir., Bd. xi, Heft 2.

² Lancet, Apr. 16, 1904.

³ Deut. med. Woch., Aug. 27, 1903.

accompanied with a feeling of heat and with decided pain in the knee. Nothing could be discovered upon ordinary examination. At one time, both knees had been involved; but both joint-cavities had been washed out, and the right had remained normal afterward. The left had remained normal for 3 years after this procedure. An iodoform-glycerin emulsion was injected into the joint during an attack, after the fluid had been emptied. The result of this treatment was that so long as the man was observed, the attacks had not returned.

ACUTE TRANSITORY EDEMA.

H. Quinke and A. Gross¹ contribute some interesting observations concerning **rare localizations** of acute localized edema. They particularly refer to the fact that this disorder has rather **protean clinical characteristics**. Its symptoms are likely to be dependent, to a considerable extent, upon the situation of the edema, whether in the skin or in the mucous membranes, whether in the subcutaneous cellular tissue or **beneath the periosteum**, etc. The latter occurs in a few cases. One such has previously been described, and the authors now report 4. In the first three of these there were transitory edemas of the skin, together with transitory swellings under the periosteum, which occurred along the bones of the arms and hands and those of the skull. Sometimes the attacks lasted only a day or two, or merely a portion of a day; and sometimes for several days. In 2 cases Rontgen-ray examinations showed the absence of any abnormal shadow, indicating that these swellings were not due to hemorrhage. One patient was an alcoholic; another, a neurasthenic. In the third case, that of a child, there was intestinal disturbance. The fourth case had been taken for one of syphilis, the swellings lasting considerably longer than in the other cases, but vanishing much more rapidly than is possible in real periostitis. This patient had also had severe headaches, which were thought to be due to an angioneurotic hydrocephalus. Among the striking symptoms that may be caused by acute transitory edema the authors mention **swelling of the larynx**, reporting a case in which this occurred, but produced very mild symptoms; and another in which it was accompanied with quite severe symptoms. When the latter case was first observed, there was much doubt as to the nature of the condition, it being thought to be an edema of the larynx, possibly secondary to tuberculosis or syphilis, or perhaps to be an erysipelas of the larynx. These conditions, however, could be excluded; and idiopathic edema was the only satisfactory diagnosis. A case is also mentioned in which a remarkable attack of violent dyspnea occurred suddenly, the diagnosis at first being entirely obscure. The patient was immediately admitted to the hospital; but, half an hour after the attack, she showed only scattered râles. A few hours later the lungs were quite normal. The patient expectorated edematous fluid with a little blood. Next day she showed swelling of the left half of the u

¹ Deut. med. Woch., Jan. 1 and 7, 1904.

disappeared after 2 or 3 days. Subsequent questioning elicited the fact that she was subject to attacks of acute localized edema. There had undoubtedly been laryngeal edema in this case; but the observation at the time of the attack and the character of the sputum made it practically certain that there had been **involvement of the lower respiratory passages also**. The **digestive tract may likewise be involved**, and 3 cases in which this tract was involved are discussed. In the first, there was visible edema of the tongue and of portions of the surface of the body; in the second, edema of the uvula and of portions of the surface could be observed, and the patient also had attacks of a feeling of pressure in the abdomen with frequent bowel-movements. These attacks were accompanied with general systemic disturbance and lasted about 24 hours. In the third case there was edema of the uvula and of the neighboring tissues; and attacks of nausea, vertigo, and vomiting, the vomitus being slightly bloody. There was also slight fever. The attacks of disturbance of the stomach were peculiarly paroxysmal. The vomitus was strongly alkaline, was large in amount, and contained a great deal of coagulable albumin. This was apparently a case of acute **transitory edema of the gastric mucous membranes**. These cases illustrate the extreme variability in the picture of acute edema. The authors think it possible that other obscure disease-pictures may be due to it, for example: acute **transitory muscle-pains and neuralgias**, and sometimes migraine; many of the manifestations of hysteria and some disturbances of the central nervous system, influencing both the motor and the psychic sphere.

GENERAL IDIOPATHIC EDEMA.

K. Staehelin¹ reports a remarkable case of general idiopathic edema with **fatal issue**. The condition began with marked redness of the skin, which gradually gave place to the normal color; but swelling occurred, and extended over the whole body, including the mucous membranes of the mouth and throat. On the forearms and legs there was for some time **alternate redness and nodule-production**. The urine was free from albumin, and no cause for the edema could be determined. Treatment was practically valueless; although sweating, perhaps, reduced the edema. There was increasing constriction of the glottis; and death finally occurred, after 7 weeks' illness, of pneumonia. **Autopsy showed no cause for the edema**. The author does not think that it was an eczema or an erysipelas. He considers it, rather, to have been an "essential edema."

SCLERODERMA.

G. C. R. Harbinson² reports the case of a woman of 45 who had scleroderma and also a marked coldness of the hands and coldness of the finger-tips, which had been called whitlows.

¹ Zeit. f. klin. Med., Bd.

Jan. 16, 1904.

at the finger-ends. The patient also had **peculiar pigmentation**, which closely resembled Addison's disease; though the typical symptoms of Addison's disease were absent.

CRYPTOGENIC ACID-INTOXICATION.

F. C. Moore¹ reports several cases of acid-intoxication *sui generis*. One occurred in a woman of 30, who had for some months had **gastric disturbance** with constipation. Four days before death she became drowsy; experienced air-hunger; emitted a strong odor of acetone; and had acetone, diacetic acid, and beta-oxybutyric acid in the urine in large quantities. She died in coma, which had lasted 20 hours. She had no signs of diabetes. In the second case, a girl of 14 years had **recurrent attacks of vomiting** and constipation, without any signs of gastrointestinal lesion, the condition resembling cyclic vomiting. She also had in the urine the evidences of severe acid-intoxication. Under diet, laxatives, and alkalies, her symptoms disappeared. The author also mentions a case in which there were transitory symptoms of marked **acid-intoxication in a patient who had mitral disease** with lost compensation.

T. R. Offer,² in a study of **acetonuria and its relation to diet**, decides that it may be due not only to using fats and the varying amounts of fatty-acids contained in these fats, but also, in simple acetonuria resulting from abstaining from carbohydrates, to stagnation and tissue breakdown. He could not determine that acetone-production is dependent to any extent upon increased fatty-acid production in the intestine.

DISEASES OF THE BLOOD.

METHODS OF EXAMINATION.

W. M. Strong and C. G. Seligman³ describe a **new method of counting the blood-corpuscles**, the principle being to dilute a measured quantity of blood with a measured quantity of fixing solution containing a suitable stain; a measured drop of this is then placed upon a slide and allowed to evaporate, and a cover-glass is placed over it, the preparation being mounted in balsam. The corpuscles in this smear are then counted. For leukocytes, they put 5 cu. mm. of blood into 495 cu. mm. of a normal solution of sodium chlorid containing methyl-violet, formalin, and distilled water. The leukocytes are counted after the preparation has been prepared, as already described, by affixing an overlying diaphragm to the eyepiece; and, by means of this, going over the whole drop, beginning below and going upward. A mechanical stage is necessary. The red cells are then counted by taking 5 cu. mm. of the first dilution, and diluting this with 995 cu. mm.

¹ Brit. Med. Jour., Nov. 21, 1903, p. 1535.

² Wien. med. Woch., Aug. 15, 1903.

³ Brit. Med. Jour., July 11, 1903.

of an eosin-solution; they are then counted, also using the diaphragm. The pipets used have to be standardized to deliver 5 cu. mm., and not merely to hold this amount. The authors give some figures for comparison with counts made with the Zeiss slide, the differences in the counts running below 5 % of the total.

J. Mitulescu¹ has made a study of **colorimetric methods and of the Hoppe-Seyler factor** in determining the amount of hemoglobin in the blood. He finds that the results from these methods are very much the same, except when hemolytic substances are at work and increase the amount of iron in the serum.

K. Preisich and P. Heim² discuss a method that they have developed for **differentially staining the blood-plaques**. The stain used is a modification of that of Romanowski. They state that by this method they can demonstrate nuclear staining in the blood-plaques; and can show that these are found not only without, but also within, the red cells. The authors **believe that the blood-plaques are nucleus-like bodies**, and are cast off from the red cells into the circulation. They are inclined to think that the blood-plaques and the actually recognizable nuclei of the red cells are merely different stages of the same things. They even make the remarkable statement that the neutrophile granules of the polymorphonuclear leukocytes are blood-plaques that the leukocytes have taken up by phagocytosis. [The observations naturally arouse skepticism.]

J. A. Dare³ describes a new **instrument for determining the alkalinity of the blood**, the main point in the method used being to observe the spectrum and note the point at which the hemoglobin-spectrum disappears. This is considered by Dare to be the neutral point. Titration with tartaric acid is then carried out. He describes the result that he has obtained in a series of cases, using this instrument. He finds a more or less constant relation between the alkalinity and the color-index, and emphasizes this point. He finds the alkalinity decreased in tuberculous disease with glandular involvement; while in tuberculous meningitis or peritonitis there is an increase. Gastric ulcer shows a reduced alkalinity, while gastric cancer shows the alkalinity to be high. Anemia shows a decided fall in alkalinity. In splenomedullary leukemia he finds a decrease; in splenic anemia and in cholemia, an increase. [The method is ingenious, but its accuracy has not been demonstrated and, from the nature of blood, it is not probable that any method of simple titration will give results of any clinical value.]

W. Orlowsky⁴ discusses the alkalinity of the blood. He recommends that this be **studied in connection with the number of the red cells**, and their resistance to non-isotonic solutions. He thinks that by using the Landois-Jaksch method to determine the alkalinity one may, at the same time, determine the degree of resistance of the red corpuscles. Increasing alkalinity is an evidence of increasing destruction of

¹ Zent. f. inn. Med., Feb. 13, 1904.

² Deut. med. W.

³ Johns Hopkins Hosp. Bull., July, 1903.

⁴ Deut. med. Woch., Aug. 20, 1903.

author thinks, therefore, that to carry out the Landois-Jaksch method 10, 15, 30, and 60 minutes after the blood has been drawn will give a good indication of the resistance of the red cells and also of the alkalinity of the blood. He reports his results in 63 cases. He finds that the **alkalinity is proportionate to the number of red blood-cells**. Merely determining the alkalinity of the blood is not sufficient to demonstrate anything of importance; except in rare instances, when a marked acid-intoxication can be demonstrated. Acid-intoxication should not, however, be considered to be present unless the alkalinity is much decreased, without a coincident decrease in the number of the red cells. He has, so far, observed this condition in only severe diabetes mellitus and the cachexia of carcinoma. Warm alkaline clysters increase the alkalinity of the blood in a marked degree—in a more marked degree than does the internal use of alkalies. This increase in the alkalinity, however, lasts but a short time.

H. Strauss and B. Chajis¹ have carried out a series of **refractometric determinations of the albumin** in human blood-serum and other body-fluids, using Abbé's refractometer; and determining, at the same time, the albumin of the food, by means of the Kjeldahl nitrogen-method. They also determined the influence of temperature and of the amount of urea and sugar in the blood upon the refraction, and likewise the influence of various physiologic and pathologic conditions. They contribute a large series of observations, and state that the method may be carried out with extreme rapidity; it takes only about 1 minute to determine the refraction. The results obtained are sufficiently accurate for practical purposes and are, they believe, valuable. They think that by this method one **may determine the presence and the degree of hydremia**, and follow its course in cases such as cardiac and renal disease and diseases of the blood. One may also determine the influence of sweat baths and other such treatment.

GENERAL CONSIDERATIONS.

J. Weinzirl,² in discussing **changes in the blood produced by high altitude**, reports a series of observations made by him, which have led him to believe that cold is an important factor in causing changes in the blood due to high altitude; although he does not maintain that it is the only factor. He finds that the specific gravity, the hemoglobin, and the volume of cells follow, in a general way, the increase or the decrease in the red cells with change of altitude. While his data are not sufficient for a final conclusion, he finds no evidence that a decrease in the size of the cells accompanies an increase in the cell-count; his observations rather support the contrary view.

P. Morawitz,³ in a series of experiments concerning the **process of coagulation of the blood**, finds that blood-plates, when entirely

¹ Zeit. f. klin. Med., Bd. lii, Hefte 5 u. 6.

² Am. Jour. Med. Sci., Aug., 1903.

³ Deut. Arch. f. klin. Med., Bd. lxxix, Hefte 3 u. 4.

isolated and cleansed, contain thrombogen in large amounts. Apparently then this substance is found, not in solution in the circulating plasma; but largely in the formed elements, and chiefly in the blood-plates; for the white corpuscles often contain little or none of it. This indicates that the **blood-plates are not mere degeneration-products**, but are special cellular elements. The author considers, also, that the blood-plates contain a small amount of thrombokinase. Some of this kinase is probably yielded by other elements, particularly the leukocytes.

A. Landau¹ reports some observations concerning the **osmotic pressure of the blood** in normal persons; and also notes the influence of disturbance in respiration, metabolism, and the action of the kidneys. Dyspnea and cyanosis did not have any marked effect. Subnutrition produced by a strict milk-diet had almost no influence. The use of thyroid-preparations for the purpose of causing a pathologic excitation of metabolism produced a reduction in the freezing-point, due chiefly to the increase in chlorids. With this there was a loss of albumin. Of 2 cases of nephritis, the author found reduction of the freezing-point in 1, and no noteworthy effect in the other. In discussing the literature of the subject, he finds that uremia almost always causes an increase in the osmotic pressure. His observations in a series of cases of nephritis correspond with those of others. He finds that the variations in the sodium chlorid do not correspond with those in the freezing-point. In 8 out of 15 cases he found no reduction in the albumin of the blood. Increase in osmotic pressure indicates, he believes, **insufficiency of the kidneys**; but only when the nitrogen-content of the serum is observed, and is found not to be decreased. A normal freezing-point of the blood may be associated with insufficiency of the kidneys, especially when this is associated with decreased nitrogen-content. Landau has observed increased osmotic pressure in cardiac cases with lost compensation, and this he attributes to a disturbance in the renal function. He has also made a series of observations in cases of infectious disease. Fever, he thinks, has no influence upon the osmotic pressure. In 2 cases of diabetes the pressure varied, being normal in 1 and reduced in the other.

E. N. Cumliffe² reports his observations of **the blood in 110 cases of malignant disease**, 91 being cancer and 19 sarcoma. There was always a diminution in the hemoglobin and in the index, 1 case only having shown a high hemoglobin-percentage, and this having been due to concentration of the blood. The latter was caused by starvation resulting from esophageal cancer. The red cells were by no means so constantly reduced. In 109 cases, the number was over 4,500,000. The high counts sometimes observed are probably due to concentration. Leukocytosis was observed in 32; it was often absent in the early stages. It is more constantly present when metastasis has occurred. For example, in gastric carcinoma with metastasis, it was always present; but **when metastasis was absent, leukocytosis was not present**. It is usually seen when there is marked cachexia. In primary cancer of the

¹ Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 5 u. 6.

² Med. Chron., Sept., 1903.

breast, in which cachexia is usually absent, the average count was below 10,000; while in recurrent cases, in which cachexia is the rule, the average count was over 13,000. The count is, of course, likely to be high when there is hemorrhage, ulceration, or septic infection. The polymorpho-nuclears were usually increased. When these are increased in number, even in the absence of leukocytosis, the possibility of malignant disease should be considered.

E. Bloch¹ discusses the changes that occur in **the blood in tumors of the bone-marrow** and divides them into 5 varieties: (1) Those of simple chronic anemia; (2) those of progressive pernicious anemia; (3) those of leukemia; (4) transition forms between the last 2 varieties, 1 variety sometimes being more prominent, and at other times the other; (5) cases in which there is the appearance of severe anemia, but in which the picture does not correspond with any of the types mentioned. Such a picture may remain until death, or the case may ultimately take upon itself **the appearance of progressive pernicious anemia or of leukemia**. The author describes a case in which he considers the examination of the blood to have been of the **utmost importance in establishing the diagnosis**. The chief points in the case were the presence of spinal symptoms suggestive of a newgrowth, a diagnosis of a growth of the marrow being made because of the presence of as many as 12 % of myelocytes, indicating irritation of the marrow. The presence of a large number of myelocytes he considers important, particularly in connection with progressive pernicious anemia, in which spinal symptoms without tumor of the marrow are very common. It is a noteworthy fact that this patient with myeloma exhibited marked enlargement of the spleen, an unusual condition in myeloma. The conditions of the blood other than the myelocytosis were more those of an advanced and increasing anemia, without leukocytosis and without other important alterations in the relative percentage of the leukocytes. [It can hardly be doubted that a diagnosis of tumor of the bone-marrow based largely upon a myelocytosis would often lead one into error. The spinal symptoms might readily be due to the anemia alone, rather than to a newgrowth. The diagnosis is necessarily extremely difficult in most cases.]

S. Klein² gives an extensive discussion of **lymphatic leukemia and lymphomatosis**, basing his observations upon the cases reported in medical literature, and also upon 90 cases of conditions grouped under the names of leukemia and pseudoleukemia. Of these 90 cases, 41 were leukemia; and 23 of the 41, lymphatic leukemia. There were 15 cases that closely resembled leukemia, but were not put in the definite class of this disease. In discussing acute leukemia, Klein particularly notes that swelling of the glands is often absent; and that the most characteristic symptoms are the condition of the mouth and the hemorrhagic diathesis, together with anemia. Splenic enlargement is frequently absent. The diagnosis from other conditions resembling acute leukemia is often extremely difficult when the leukocytic count is low.

¹ Deut. med. Woch., July 23, 1903.

² Zent. f. inn. Med., Aug. 22 and 29, 1903.

In such instances, however, one always finds a marked increase in the number of lymphocytes. Klein believes that **a comparatively slight leukocytosis is frequently met in acute leukemia**. The leukocytes indeed may be scarcely at all increased in total number, but the lymphocytes are always relatively increased. Pernicious anemia is one of the most important diseases to exclude. This may be done chiefly by noting the course of the latter, the absence of changes in the mouth, and the almost constant absence of leukocytosis. After discussing cases bearing upon this point, Klein decides that **acute and chronic leukemia are merely different forms of the same disease**. Chronic lymphemia with a rather low leukocyte count is, he considers, quite frequently encountered. Again, the important point is the marked increase in the number of lymphocytes. He mentions a striking case in which there were the usual evidences of chronic lymphatic leukemia. During the course of a pneumonia the leukocytes were reduced to as low as 2400; and the lymphocytes to 39.5 %, while they had previously reached over 98 %. In connection with this case Klein insists upon the fact that the number of lymphocytes, as well as the degree of leukocytosis in chronic lymphemia, may vary greatly in the same case and in different cases. After a critical discussion of the nature of pseudoleukemia, as this condition is accepted by various authors, particularly Pincus, Klein decides that this disease is **frequently transformed into leukemia**; and that there is **no actual distinction between pseudoleukemia and leukemia**. He thinks that the symptom-complex of pseudoleukemia, as the condition is usually described, is a wholly artificial picture. Lymphocytic pseudoleukemia is, he believes, always leukemia. He discusses the differential diagnosis between tuberculosis of the glands and pseudoleukemia, which he thinks can usually be made; and also mentions the much more difficult question of distinguishing between leukemia or pseudoleukemia and sarcoma of the glands. After a discussion of the latter point he reaches the conclusion that a considerable number of cases exhibit no features that place them distinctly in either the class of leukemia or that of sarcoma; and he thinks that leukemia may best be looked upon as a **widespread neoplastic condition of the lymphatic tissues**. He describes at length one interesting case in which the clinical symptoms in many ways closely resembled leukemia, but in which post-mortem examination showed apparent sarcoma of the heart, the kidneys, and the prostate. Examination of the bone-marrow, however, showed a marked lymphocytic infiltration of the bone-marrow, of typical leukemic type. He leans, therefore, to the view that the sarcoma-like condition of the heart, the kidneys, and the prostate was really leukemic. He particularly insists upon the importance of lymphocytosis as distinguishing pseudoleukemia, as ordinarily so-called, from tuberculosis. This sign is not always present; but when it is, in Klein's belief, it **practically excludes tuberculosis**.

E. Bloch¹ discusses the occurrence of **severe disease of the blood, presenting the picture of an acute endocarditis**. He first de-

¹ Deut. med. Woch., July 16, 1903.

scribes a case of progressive pernicious anemia that had a markedly acute onset, but ran an unusually favorable course after a short time. The red cells became reduced to 475,000. The marked cardiac symptoms and the presence of fever were such as to indicate the possibility of acute septic endocarditis. Bloch considered it possible that there was also an infectious complication in this case. The man subsequently died with a return of his symptoms of severe anemia, and a postmortem could not be carried out. [From the description given, it is difficult to assent freely to the statement that this was a case of progressive pernicious anemia.] Bloch also refers to the **danger of mistaking acute leukemia for septic endocarditis**, and describes a case under the care of other observers in which the latter diagnosis was made, but in which examination of the blood after death, as well as histologic studies and the general macroscopic conditions of the organs, made it perfectly evident that the case was one of acute leukemia.

E. J. Brown¹ reports a case of severe anemia in which a **symptomatic cure was obtained through using the Röntgen-ray alone**, arsenic having been given during the early part of the treatment, but having been stopped. Six months later the patient appeared to be well.

W. Steinwand² reports a case of pseudoleukemia in which the use of the Röntgen-ray caused the patient to return to apparent health.

THE LEUKOCYTES.

A. Wolff³ contributes a study of the **granulations of the leukocytes** by various methods, and decides that the general division of leukocytes according to the granules should be retained. Neutrophile granules from the same animal may show various shades of color between blue and reddish violet, and they do not give identical reactions with different stains. He believes, however, that there should not be distinctions made between the various neutrophile granules, as this would be useless, and would lead to confusion. The azure stain shows granulations of the lymphocytes and of the mononuclear leukocytes, which present peculiar conditions of solubility, these variations in solubility being the explanation of the fact that these granules are sometimes found in lymphocytes and are sometimes absent. He believes, however, that the **azure granules are specific**, as are the neutrophile. He considers their presence to indicate that there are in the blood no leukocytes that are ungranulated, and that the leukocytes cannot be divided according to the presence or the absence of granules, for this is merely a question of staining. He believes that the presence of similar azure granules in the lymphocytes and in the mononuclear leukocytes indicates a **close relationship between these two types of cells**.

M. Mosse⁴ finds that the **combination of eosin and methylene-blue** consists of 2 parts of methylene-blue and 1 part of eosin. From this he

¹ Jour. Am. Med. Assoc., Mar. 26, 1904.

² Jour. Am. Med. Assoc., Mar. 26, 1904.

³ Zeit. f. klin. Med., Hefte 3 u. 4. ⁴ Berl. klin. Woch., Aug. 10, 1903.

decides that the myelocytes contain the real neutrophile elements, while the polymorphonuclear leukocytes show granules with weakly basic peculiarities. They are, in other words, **weakly acidophile or neutro-acidophile**. He thinks the latter term would suit them better than the term neutrophile.

A. Wolff¹ reported to the Berlin Medical Society a case in which 10 % of mast-cells had been found in a pleural exudate, although leukemia was absent. He believed this to indicate the **hematogenous origin of mast-cells**.

O. Kurpjuweit² contributes some studies of the spleen in cases of pernicious anemia, and also in a series of cases of other illness. He particularly refers to the observation of **myelocytes and nucleated red blood-cells in the spleen**, even in cases in which these are not present in the circulation. He believes that they occur in small number in the spleen, in normal circumstances; and that they increase under the influence of fevers, anemias, circulatory stagnation, etc. He believes that these observations indicate that the spleen has a hematopoietic function, or that it assumes such a function in certain circumstances.

A. Wolff³ has made a study of the **glycogen reaction of the leukocytes** and has come to the following conclusions: It is not true, as has usually been stated, that the normal leukocyte is glycogen-free. Normal leukocytes contain this substance, but it can be demonstrated only by a method called by him the vital iodine fixation method, in which iodine-vapor is allowed to act upon the moist preparation. The **glycogen of normal leukocytes is remarkably soluble in water**; consequently, the normal preparations must be examined with great rapidity. The solubility in water differs in various animals to a large extent; and even in the same species. When the leukocytes emigrate from the blood-vessels and in infectious diseases, the glycogen's solubility becomes reduced; therefore the presence of the glycogen is demonstrated by means of the old methods. The author does not believe that the presence of glycogen in leukocytes is at all an indication of a degenerative process. This idea is dependent upon the methods used. He thinks that one may correctly say, however, that if the glycogen in the leukocytes becomes soluble in water with difficulty, this indicates a degenerative process in the leukocytes.

Sorochowitsch⁴ discusses the literature concerning the glycogen-reaction of the leukocytes, as well as some extensive work of his own. He mentions a **large series of diseases in which the reaction is found**, and others in which it is not. He believes that one may suspect the presence of pus, if the reaction is present when the symptoms are suspicious; but that the **reaction is far from being pathognomonic**. He has found it not only in pneumonia and other disturbances of respiration; but also in coprostasis, circumscribed carcinoma, certain intoxi-

¹ Zent. f. inn. Med., Jan. 23, 1904, p. 6.

² Deut. Arch. f. klin. Med., Bd. lxxx, Hefte 1 u. 2.

³ Zeit. f. klin. Med., Bd. li, Hefte 5 u. 6.

⁴ Zeit. f. klin. Med. Bd. li, Hefte 3 u. 4.

cations, etc. He thinks, however, that it is **a help in diagnosis, in that it is suggestive.** He believes it to be of no importance, in prognosis or otherwise, in blood-disease. He considers it a help in the diagnosis between acute gonorrheal arthritis and acute arthritic rheumatism, since it occurs in the former but not in the latter. The reaction undoubtedly has a relation to nonbacterial as well as to bacterial poisons. Sorocho-witsch has often found it present when there was no leukocytosis, but leukocytosis is usually noted when the iodine-reaction is present. The presence of the glycogen-reaction he considers to be **due to disturbance in the activity of a ferment** that transforms glycogen into sugar within the leukocytes. The reaction, therefore, indicates a disturbance of cell-function in the leukocytes.

G. L. Gulland¹ has made a study of the glycogen-reaction in the blood, and insists upon its importance in diagnosis. Among the points that he especially emphasizes are its **value in determining the necessity for surgical intervention in appendicitis.** In the bad cases in which there is a low leukocytosis, he finds the glycogen-reaction always well marked. The contrary, also, he finds to be true.

CHLOROSIS.

Breuer and v. Seiller² have made an experimental study of the theory that chlorosis is due to **anomalies in the genital apparatus,** determining in animal-investigations the influence of castration upon the blood of females. They find that, without exception, young animals show, after this procedure, a reduction in the number of red cells and in the amount of hemoglobin, which is followed, after a few weeks, by normal conditions. Extirpating the uterus does not produce this. They believe that the results offer some support of the theory of genital chlorosis.

PERNICIOUS ANEMIA.

E. Bloch³ contributes a discussion of various points in pernicious anemia. He first takes up the **question of the enterogenous origin of the disease,** and firmly opposes the view that any proof of such an etiology has been given. He has been unable to find any particularly toxic substance in the feces of the subjects of this disease, as compared with those of normal persons. The study of the ethereal sulfates of the urine has shown nothing of importance. The investigation of the toxicity of the urine, also, has given no result of consequence, and the search for ptomaines has shown in only one instance a diamin. The author also **criticizes the work tending to show a toxic increase in metabolism.** He believes that these results were due to the variations in the food depending upon the varying condition of the patient's appetite. The

¹ Brit. Med. Jour., April 16, 1904.

² Wien. med. Woch., 1903, No. 30.

³ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 3 u. 4.

reports of atrophy of the intestinal mucous membrane he also criticizes, particularly referring to Heubner's views concerning intestinal atrophy in infants as a demonstration of the incorrectness of the ideas that have been held in regard to intestinal atrophy. He questions whether it has been demonstrated that bothriocephalus anemia, when it is of pernicious type, is due directly to the bothriocephalus; and whether the bothriocephalus produces an actual pernicious anemia. In general, his conclusion is that progressive pernicious anemia is not an essential disease of the blood itself, but is due to a **primary asthenic condition of the blood-building tissues**; that there is an **individual predisposition to pernicious anemia**, which is set in motion by various causes; and that the disease really consists in the production of blood-cells that are abnormally easily destroyed. [The argument offered is interesting; the conclusions are not convincing.]

W. Elder and E. Matthew¹ report 2 cases of **pernicious anemia following parturition**. The patients were 29 and 31 years of age, respectively. They discuss the views concerning the relation between pregnancy and pernicious anemia, and note that recently the general tendency has been to make light of this cause of pernicious anemia. These 2 patients were, so far as could be determined, healthy up to the occurrence of the last pregnancy. In both, after labor and **without post-partum hemorrhage**, there was a sudden onset of rapidly progressing anemia. This terminated fatally in 5 weeks in one case, and in 10½ weeks in the other. In both cases the teeth were found in very bad condition. In the second case a postmortem examination was obtained, and the stomach and intestines were reported to be healthy. The authors believe that the theory of the gastrointestinal origin of the condition does not offer a satisfactory explanation of the sudden onset or aggravation of the symptoms after parturition. They consider it quite possible that the occurrence of the condition or its aggravation after parturition may be the result of **toxic products thrown into the blood after parturition**, these products especially favoring hemolysis. [A view that has considerable support from modern work on the pathology of puerperal eclampsia.]

Pasteur² reported a case of **pernicious anemia with peculiar features** occurring in a man of 24. The patient had been well until 3 weeks before admission. He had hemorrhage from the gums, was very pallid, had double hemorrhagic neuroretinitis, with gastric disturbances and with a very low blood-count and a high color-index, marked leukopenia, and relative lymphocytosis; but he had **no nucleated red blood-corpuscles and no poikilocytosis**. There was no evidence of nephritis. Necropsy showed a marked deposit of iron in the liver, some deposit in the spleen, and a very marked deposit in the testes. Chemic examination demonstrated that there was more than 6 times the usual amount of iron in the liver, and more in that organ than in the spleen. In discussion, W. Hunter suggested that the case **resembled one of septic anemia**. Pasteur, in reply, said that there was no evidence of sepsis, either before or after death.

¹ Lancet, Aug. 8, 1903.

² Brit. Med. Jour., Nov. 21, 1900

C. B. Gray¹ reports a case of pernicious anemia in which there was **marked fever and a somewhat striking appearance of sepsis**, but in which no evidence of such a condition was found after death. The patient's red blood-cells became reduced to less than 700,000. The points upon which stress is laid are the presence of abnormalities in the form of the liver, and marked gastropsis and enteropsis. Many hemolymph-glands of somewhat considerable size were found.

J. J. Walsh² reports a case of pernicious anemia in which **antistrep-tococcic serum** was used without any favorable results.

LEUKEMIA.

H. Luce³ discusses the condition for which Leube proposed the name of **leukanemia**—a term based upon Leube's case (previously described in the YEAR BOOK), in which there was a **combination of the hematologic appearances of pernicious anemia and of mixed leukemia**. Some signs of each disease were, however, absent in this case; there were very few megaloblasts in the bone-marrow and no siderosis of the organs was noted; but there were red metaplasia of the bone-marrow, myeloid changes in the spleen, and leukemic deposits in the various organs—especially in the liver. A similar case has been reported by Kormöczy, and Luce now reports another. The red cells in the latter case progressively decreased from the first record of 2,428,000 to 1,152,000; while the white cells varied between 37,600 and 81,600. The hemoglobin varied between 45 and 20. There was marked poikilocytosis and anisocytosis; and many microcytes and megalocytes and some normoblasts and megaloblasts, with polychromatophilia. The leukocytes showed increasing numbers of large mononuclears, the highest count being 49.5 %. [It is noteworthy that the only count of myelocytes given in the table was 0.5 %.] Postmortem examination showed leukemic infiltration of various organs, lymphadenoid metaplasia of the bone-marrow, and large numbers of the "elements characteristic of pernicious anemia," with an entire absence of siderosis. After discussing these cases Luce comes to the conclusion that the pernicious anemia in them was of myelogenous origin, and that the **primary lymphadenoid or myeloid metaplasia of the bone-marrow** had given rise to the pathologic growth in the erythroblastic tissues. After reviewing the various similar cases reported he concludes that some are posthemorrhagic; some are toxic, and due to known poisons introduced from without; and some others are toxic, but result from poisons developed within the organism. He thinks that this "leukanemic" condition does not deserve a special place among the diseases of the hematopoietic system; and that there is only a quantitative and not a qualitative difference between these cases and those in which the signs of anemia are less striking. He presents the view that cryptogenetic pernicious anemia, except when this condition is primarily or secondarily due to tumors of the bone-marrow, is the result of a leukemic meta-

¹ N. Y. Med. Jour., July 11, 1903.

² Med. Rec., Feb. 27, 1904.

³ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 3 u. 4.

plasia of the bone-marrow that stimulates the pathologic proliferation of the erythroblastic tissues. This proliferation takes on the character of tumor-growth; *i. e.*, it acquires an uncontrollable tendency to progress. [A view that is difficult to support against much of the evidence at hand.]

P. Reckzeh¹ reports a series of cases of leukemia, with some casuistic remarks concerning them. In discussing the question of the myelogenous origin of a case of leukemia, he mentions that in a case of **typical lymphatic leukemia there was marked bone-tenderness during life**, and that necropsy showed lymphatic infiltration of the bone-marrow. Microscopic examination demonstrated that this was due to the same sort of lymphocytes as were found in the blood. In a case of almost pure lymphemia the author investigated the question of the motility of the lymphocytes. Cantharidal blisters were produced, and these were found to contain only polymorphonuclear cells. The **lymphocytes did not show active movement** in this experiment. He also gave bitter drugs to the patients, thinking that he might produce with them a positive chemotaxis. There was no marked change in the relative number of the white cells, however, and he thinks that this also is to some extent evidence against the motility of the lymphocytes.

G. Dock² contributes an interesting discussion on the **influence of complicating diseases upon leukemia**, referring to 27 cases in medical literature and 2 personal cases in which tuberculosis occurred with leukemia. He decides that chronic tuberculosis does not materially alter the course of leukemia or the leukocyte-formula, while acute miliary tuberculosis is usually followed by or associated with reduction of the leukocytes. He also discusses 23 cases of intercurrent infection other than tuberculosis, one case being his own. In the great majority of cases they cause a fall in the leukocytes, which in some cases becomes an extreme leukopenia; and the enlarged organs often become much smaller. **The changes in the leukocyte-formula are not uniform**, although there is a tendency for the leukemic characteristics to disappear. The fall commonly occurs quite quickly after the infection in acute infections; much more slowly in the chronic. There is likely to be a rapid rise in the leukocytes after a fall, but with a great decrease in the size of the previously enlarged organs. Dock believes that **experiments with bacterial products or organic extracts** may produce important results in the therapy of leukemia.

W. J. Susmann³ discusses the literature concerning **leukemia and tuberculosis**, having collected, in all, 25 cases. He concludes that their association is uncommon in either form of leukemia, but that it is **2½ times more frequent in the lymphatic** than in the splenomedullary form. It is 6 times as common in the male as in the female. Most often, the tuberculosis has been latent, and lights up as the result of the leukemia. Sometimes it is entirely latent and obsolete; at others, it is a terminal infection. When the two diseases are combined, there is a tendency for the number of leukocytes to diminish, and for the spleen

¹ Zeit. f. klin. Med., Bd. 1, Hefte 1 u. 2.

² Am. Jour. Med. Sci., April, 1904

³ Practitioner, Oct., 1903.

and the glands to decrease in size. Susmann thinks that the antagonism between the two diseases is **probably due to the excess of nuclealbumin** and to an increase in the phagocytic power of the blood.

Acute Leukemia.—A. Januszkiewicz¹ reports a case of acute leukemia that occurred in a patient of 42 years, who was admitted to the hospital on April 27 with the story that he had been ill 4 weeks. His disease lasted until May 8. He had the usual stomatitis. There were no evident hemorrhages. There was some enlargement of the glands and of the spleen. It is of interest that the **uric acid was determined and found not to be increased** 2 days before death, the conditions at that time being practically the same as they had been a week previously. **The urea at this time was decreased**, rather than increased, being only 14.58 grams in 24 hours. The white cells reached as high as 140,000, the greater number belonging to the large mononuclear group. Postmortem examination showed extensive leukemic infiltrations, marked enlargement of the lymph-glands, scattered hemorrhages, and leukemic transformation in the bone-marrow. Cultures and animal-inoculations were negative. An extensive report of the histologic conditions in the organs is given, as also of the histology of the blood-cells. The chief point made by the author is **that the endothelial cells in the various tissues and organs** were so numerous as to suggest the idea that they may have an important part in the production of the lymphomas and of the large lymphocytes. He thinks it possible that the endothelium normally bears an important relation to blood-production.

J. B. Nichols² contributes an extensive discussion of the etiology of acute leukemia, based upon a collection of literature; and decides that heredity, traumatism, and previous disease are of subsidiary etiologic moment. The evidence concerning an infectious origin is negative, and he thinks that at present the facts indicate that it is either **a toxic disease or one due to a peculiar leukocytic hyperplasia**—the former being the more probable.

L. V. Hamman³ reports a case of acute leukemia and gives an interesting discussion of the literature of this disease. He states that, in all, he has **collected 124 cases** up to July 1, 1903. From this list he has excluded a number of cases included by previous collectors. He believes with Wolf that **three forms of leukemia** must be recognized, with all grades between these. He has found in literature but 4 cases in which the blood-picture of Fränkel is said to have been associated with a chronic course. It is more doubtful whether the blood-picture seen in chronic leukemia is ever associated with an acute clinical course; although there are on record a few cases in which the small lymphocyte has been the predominating cell. Acute leukemia almost always shows the blood-picture described by Fränkel; and when this blood-picture is present in any case, it is almost certain to run an acute course.

J. L. Miller and J. Hess⁴ report an interesting case of acute leukemia in a man of 24, the immediate **cause of death being rupture of the**

¹ Virchow's Arch., Bd. clxxiii, Heft 2.

² Amer. Med., Jan. 23, 1904.

³ Amer. Med., July 18, 1903.

⁴ Amer. Med., Mar. 5, 1904.

spleen. The patient had had a fall a few days before his death, but it is doubtful whether this was the actual cause of the rupture of the spleen. The authors discuss the literature of the condition.

H. Savory¹ reports a case of acute leukemia in a boy 4½ years of age, running its course in 7 weeks. The majority of the cells were of the large lymphocyte type.

F. Billings and J. A. Capps² report a case of **acute myelogenic leukemia** in a man of 68 years whose illness had begun in August, 1899, having terminated 2 months subsequently. At the first examination the white count was 540,000. Of these, 30.4 % were myelocytes; 39.2 %, large mononuclears. At the last examination the blood-count was 30 % hemoglobin; erythrocytes, 1,700,000; whites, 374,000. There were many nucleated red cells. Of the white cells, 22 % were large mononuclears; 1.6 %, small mononuclears; 21.2 %, polymorphonuclear neutrophils; 0.4 %, eosinophiles; 0.4 %, mast-cells; and 54.4 %, myelocytes, 0.8 % of these being eosinophilic. The distinction between myelocytes and large mononuclears was often arbitrary, since the granulations were frequently faint. **Myelogenic acute leukemia undoubtedly occurs;** and, as has been observed, in a number of instances in which it has not been recognized. The authors have collected 8 cases that they believe to have undoubtedly been of this kind, and 2 others in which the condition was probably present. It runs the usual course of acute leukemia; and is likely to resemble chronic myelogenic leukemia with acute exacerbation, acute lymphatic leukemia complicated with some intercurrent infection, and some acute infections that are associated with grave and rapid anemia. Acute exacerbations of pernicious anemia and newgrowths involving the bone-marrow may also resemble this condition. Differential counts of the white cells constitute the only means of definitely distinguishing this disease. [The existence of such cases is of much importance to the clinician. The diagnosis and the general conception of the blood-picture have until very recently been based on the excess of the peculiar large mononuclear cells.]

C. M. Roos³ reports a case of splenomyelogenous leukemia showing 46 % of myelocytes. The case was of especial interest on account of its **comparative acuteness**, the entire duration having been about 12 weeks.

Chronic Lymphatic Leukemia.—M. Mosse⁴ reports a case of lymphatic leukemia. In examining some portions of the tonsil that had been removed, he observed that lymphocytes could frequently be found in the actual walls of the vessel. The vascular walls, at the same time, showed, as a rule, no signs of having been damaged. In some areas, however, he could see that a lymphoma had actually broken into a vein. He contributes some illustrations that, he thinks, indicate that in some areas the lymphocytes were making their way toward the lumen of the vessel. He believes that these observations show that the **lymphocytes wander from the surrounding tissues into the vessels**, and not the contrary. They also, he thinks, show that the lymphocytes may pass through an

¹ Lancet, Feb. 6, 1904.

² Am. Jour. Med. Sci., Sept., 1903.

³ N. Y. Med. Jour., June 18, 1904.

⁴ Zeit. f. klin. Med., Bd. I, Hefte 1 u. 2.

undamaged vessel wall. He has observed similar conditions in normal tonsils, but in a less marked degree; and he believes that the conditions in lymphatic leukemia are merely quantitatively and not qualitatively different from the normal, and are merely the result of the increased production of lymphocytes.

K. M. Menzel¹ describes a case of lymphatic leukemia in which there were peculiar **leukemic changes in the accessory cavities of the nose**, consisting in the appearance of many excrescences and in a general thickening of the mucous membrane. These excrescences were leukemic infiltrations. Such a condition has not previously been described. Its clinical importance lies in the fact that it **may readily lead to dangerous hemorrhage**. The mucous membrane showing this change exhibited no evidence of inflammation.

T. S. Hart² reports a case of chronic **lymphatic leukemia complicated with pneumonia**. The result of the pneumonia was a reduction in the size of the lymph-glands, the spleen, and the liver, and a fall in the number of leukocytes from 1,168,000 to 450,000. The **polymorphonuclear leukocytes were reduced in greater degree** than were the lymphocytes—an observation contrary to that of Weill, who claims that an intercurrent infection in chronic lymphatic leukemia increases the number of polymorphonuclears at the expense of the lymphocytes.

O. K. Williamson³ reports a case of lymphatic leukemia that was interesting on account of its somewhat chronic course, although there were present a large number of nucleated red corpuscles. This fact would indicate that the **bone-marrow was involved**; yet there was **no increase in the polymorphonuclear neutrophiles**, and the myelocytes never increased beyond 3.2 %.

Chronic Mixed Leukemia.—D. A. de Jong⁴ reports a case of lienal leukemia in a calf 5 weeks old. This case is important on account of the fact that the disease occurred so early and was associated with such pronounced changes as to lead the author to believe that it **must have been congenital**; also because the postmortem examination showed no changes in the lymph-glands or in the bone-marrow. He considers it to have been a case of pure lienal leukemia. His description of the conditions in the bone-marrow is extremely brief; he merely says that no abnormalities were found, and that "there was not the slightest appearance that would indicate a medullary origin of the leukemia." The **condition of the spleen was remarkable**, the whole organ having a marbled appearance as the result of many small anemic necroses.

J. Schmid⁵ reports some observations of **metabolism in a case of chronic mixed leukemia**, in which the erythrocytes and hemoglobin were greatly reduced, the former to 910,000; the leukocytes were 375,000, and there were many myelocytes. The spleen was much enlarged, and there were scattered enlarged lymph-glands. The patient was in a wretched

¹ Zeit. f. klin. Med., Bd. li, Hefte 3 u. 4. ² N. Y. Med. Jour., Aug. 1 1903.

³ Brit. Med. Jour., Nov. 14, 1903, p. 1274.

⁴ Virchow's Arch., Bd. clxxiii, Heft 3.

⁵ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 5 u. 6.

decides that the myelocytes contain the real neutrophile elements, while the polymorphonuclear leukocytes show granules with weakly basic peculiarities. They are, in other words, **weakly acidophile or neutro-acidophile**. He thinks the latter term would suit them better than the term neutrophile.

A. Wolff¹ reported to the Berlin Medical Society a case in which 10 % of mast-cells had been found in a pleural exudate, although leukemia was absent. He believed this to indicate the **hematogenous origin of mast-cells**.

O. Kurpjuweit² contributes some studies of the spleen in cases of pernicious anemia, and also in a series of cases of other illness. He particularly refers to the observation of **myelocytes and nucleated red blood-cells in the spleen**, even in cases in which these are not present in the circulation. He believes that they occur in small number in the spleen, in normal circumstances; and that they increase under the influence of fevers, anemias, circulatory stagnation, etc. He believes that these observations indicate that the spleen has a hematopoietic function, or that it assumes such a function in certain circumstances.

A. Wolff³ has made a study of the **glycogen reaction of the leukocytes** and has come to the following conclusions: It is not true, as has usually been stated, that the normal leukocyte is glycogen-free. Normal leukocytes contain this substance, but it can be demonstrated only by a method called by him the vital iodine fixation method, in which iodine-vapor is allowed to act upon the moist preparation. The **glycogen of normal leukocytes is remarkably soluble in water**; consequently, the normal preparations must be examined with great rapidity. The solubility in water differs in various animals to a large extent; and even in the same species. When the leukocytes emigrate from the blood-vessels and in infectious diseases, the glycogen's solubility becomes reduced; therefore the presence of the glycogen is demonstrated by means of the old methods. The author does not believe that the presence of glycogen in leukocytes is at all an indication of a degenerative process. This idea is dependent upon the methods used. He thinks that one may correctly say, however, that if the glycogen in the leukocytes becomes soluble in water with difficulty, this indicates a degenerative process in the leukocytes.

Sorochowitsch⁴ discusses the literature concerning the glycogen-reaction of the leukocytes, as well as some extensive work of his own. He mentions a **large series of diseases in which the reaction is found**, and others in which it is not. He believes that one may suspect the presence of pus, if the reaction is present when the symptoms are suspicious; but that the **reaction is far from being pathognomonic**. He has found it not only in pneumonia and other disturbances of respiration; but also in coprostasis, circumscribed carcinoma, certain intoxi-

¹ Zent. f. inn. Med., Jan. 23, 1904, p. 6.

² Deut. Arch. f. klin. Med., Bd. lxxx, Hefte 1 u. 2.

³ Zeit. f. klin. Med., Bd. li, Hefte 5 u. 6.

⁴ Zeit. f. klin. Med. Bd. li, Hefte 3 u. 4.

scribes a case of progressive pernicious anemia that had a markedly acute onset, but ran an unusually favorable course after a short time. The red cells became reduced to 475,000. The marked cardiac symptoms and the presence of fever were such as to indicate the possibility of acute septic endocarditis. Bloch considered it possible that there was also an infectious complication in this case. The man subsequently died with a return of his symptoms of severe anemia, and a postmortem could not be carried out. [From the description given, it is difficult to assent freely to the statement that this was a case of progressive pernicious anemia.] Bloch also refers to the **danger of mistaking acute leukemia for septic endocarditis**, and describes a case under the care of other observers in which the latter diagnosis was made, but in which examination of the blood after death, as well as histologic studies and the general macroscopic conditions of the organs, made it perfectly evident that the case was one of acute leukemia.

E. J. Brown¹ reports a case of severe anemia in which a **symptomatic cure was obtained through using the Röntgen-ray alone**, arsenic having been given during the early part of the treatment, but having been stopped. Six months later the patient appeared to be well.

W. Steinwand² reports a case of pseudoleukemia in which the use of the Röntgen-ray caused the patient to return to apparent health.

THE LEUKOCYTES.

A. Wolff³ contributes a study of the **granulations of the leukocytes** by various methods, and decides that the general division of leukocytes according to the granules should be retained. Neutrophile granules from the same animal may show various shades of color between blue and reddish violet, and they do not give identical reactions with different stains. He believes, however, that there should not be distinctions made between the various neutrophile granules, as this would be useless, and would lead to confusion. The azure stain shows granulations of the lymphocytes and of the mononuclear leukocytes, which present peculiar conditions of solubility, these variations in solubility being the explanation of the fact that these granules are sometimes found in lymphocytes and are sometimes absent. He believes, however, that the **azure granules are specific**, as are the neutrophile. He considers their presence to indicate that there are in the blood no leukocytes that are ungranulated, and that the leukocytes cannot be divided according to the presence or the absence of granules, for this is merely a question of staining. He believes that the presence of similar azure granules in the lymphocytes and in the mononuclear leukocytes indicates a **close relationship between these two types of cells**.

M. Mosse⁴ finds that the **combination of eosin and methylene-blue** consists of 2 parts of methylene-blue and 1 part of eosin. From this he

¹ Jour. Am. Med. Assoc., Mar. 26, 1904.

² Jour. Am. Med. Assoc., Mar. 26, 1904.

³ Zeit. f. klin. Med., Hefte 3 u. 4. ⁴ Berl. klin. Woch., Aug. 10, 1903.

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¹ Zent. f. inn. Med., Jan. 23, 1904, p. 6.

² Deut. Arch. f. klin. Med., Bd. lxxx, Hefte 1 u. 2.

³ Zeit. f. klin. Med., Bd. li, Hefte 5 u. 6.

⁴ Zeit. f. klin. Med. Bd. li, Hefte 3 u. 4

6 were males, and all were in the middle period of life. The most striking symptom in the condition is cyanosis, which is most intense in degree, but varies greatly at different times. The blood is viscid and very dark, and shows a marked increase in the number of erythrocytes, even reaching 12,000,000. The hemoglobin has been as high as 165. The specific gravity is high, reaching to 1083. The leukocyte-count ranges from 4000 to 30,000, but is usually below 10,000. The spleen was enlarged in 7 of 9 cases; in 4, greatly so. Albumin was observed in 7 cases, with hyaline and sometimes with granular casts. The specific gravity was low. The skin was pigmented in 5 cases. **The symptoms consist chiefly in headache, weakness, and prostration.** There was also vertigo in some cases, with pain in the abdomen and the back. Disturbance of digestion was also present in some instances. Fever was not present. The pulse was not of high tension and the vessels were not sclerotic. There was no edema, but there was mental and physical torpor. Three patients died. In discussing chronic cyanosis, the author states that it is met with in organic disease of the heart; in certain pulmonary diseases, particularly emphysema and old fibroid phthisis; and in toxic methemoglobinemia. It is also seen in certain classes of persons, such as those that are much exposed to the air and those that drink freely; but in such cases of cyanosis there is no increase in the number of erythrocytes that approaches that in the condition under discussion—except in congenital heart-disease, in which as many as 8,000,000 or 9,000,000 red cells have repeatedly been described. The author insists upon the importance of making a most careful study of the blood in cases of the type under discussion, especially of testing its viscosity. The pathology of the condition cannot be stated, but its relation to the splenomegaly usually present should be investigated.

J. Collins¹ reports 2 cases under the heading of chronic cyanosis with polycythemia and splenomegaly. The second case was the more striking. It occurred in a girl of 24 years, and began with pain in the side and increasing cyanosis of the extremities. The patient also had syncopal attacks and attacks of vertigo. Her extremities presented an extremely striking appearance. She had also had some exophthalmos. **The cyanosis was confined to the extremities.** There was marked splenomegaly, but no enlargement of the liver. The urine was normal. The erythrocytes were 9,821,000 in number; hemoglobin, 110 %; leukocytes, 17,800. The red cells were normal in morphology. There were no nucleated reds. The blood lost by epistaxis **formed no buffy coat.** The patient had digestive disturbance and tachycardia. The other case showed more than 100 % of hemoglobin; red corpuscles, 8,400,000. There was no **enlargement of the spleen.** The patient had progressive muscular atrophy of rather atypical course, and also very marked cyanosis of the extremities, which was not like that sometimes seen in poliomyelitis and other nervous disorders.

W. Türk² demonstrated to the Vienna Medical Society a man of 36 years with **polycythemia associated with a liver-condition** that was

¹ Med. Rec., Nov. 21, 1903.

² Zent. f. inn. Med., Jan. 16, 1904, p. 69.

thought to be cirrhosis. The patient also showed marked enlargement of the spleen. Türk considers that **tuberculosis and various other diseases of the spleen and the liver**, both of which organs have an undoubted relation with the myeloid system, may in certain circumstances that are as yet but indefinitely known cause a hyperplasia of the erythroblastic apparatus in the myeloid tissue, and produce polycythemia. This is frequently, but by no means always, associated with the peculiar cyanosis.

Rosengart¹ describes a case of polycythemia with enlargement of the spleen and cyanosis. The patient, a man 41 years old, had a spleen whose long diameter was 30 cm. The liver was also enlarged; and there were marked cyanosis, slight albuminuria, secondary disturbances of circulation, and pronounced emaciation. The specific gravity of the blood was 1.072. The red corpuscles were over 10,000,000. The leukocytes were moderately increased (12,000); the hemoglobin was 190 % to 200 %. In the further course of this case there were observed gastric disturbances; dyspnea; pains in the feet and legs and in the elbows, the latter being associated with local disturbances in circulation; and vomiting and cough, **the vomitus and the sputum being stained with blood**. The treatment was at first venesection, which caused some improvement. For 8 months the patient had been kept upon a **diet containing very little iron**, by Ehrlich's advice, no food containing more than 6 mg. of iron in 100 grams of dry substance being permitted. The subjective symptoms had decidedly improved, the hemoglobin had been reduced to 150 %, and the erythrocytes had been reduced to 9,000,000.

J. N. Hall and H. R. McGraw,² as a point of interest in relation to the diagnosis of chronic cyanosis with polycythemia and enlarged spleen, refer to the possibility of **confusing with it the cyanosis produced by using acetanilid** and other similar preparations. They describe a case of chronic acetanilid poisoning in which there was very marked cyanosis. The blood, however, did not show polycythemia, but exhibited a decided reduction in reds and a marked reduction in hemoglobin. After the use of this drug had been stopped and the patient had been put under proper treatment, an extremely rapid recovery was observed.

THE HEMORRHAGIC DISEASES.

J. Davidson³ reports a case that he **considers to have been scurvy** in a boy 17 years old, who had been sick about a year. **Various diagnoses had been made**, including mitral stenosis, nephritis, and pulmonary tuberculosis. The last named condition had been diagnosed on account of the fever, night-sweats, cough, some dulness at apex, and hemoptysis. When seen by the author, the patient had an extensive purpuric eruption, spongy and bleeding gums, epistaxis, enlargement of the joints, and cardiac enlargement. He was put on treatment with oranges and

¹ Mitth. a. d. Grenz. d. Med. u. d. Chir., Bd. xi, Heft 4.

² Boston M. and S. Jour., Dec. 3, 1903.

³ N. Y. Med. Jour., Jan. 9, 1904.

lemon-juice, beef-juice soon being added. He began to improve at once, while there had been no previous improvement. He also had had **symptoms of multiple neuritis**, a complication that is, at best, extremely uncommon in scurvy.

J. Orr¹ reports a case of **Henoch's purpura**. At the age of 14 the patient had so-called rheumatic purpura. At 15 a condition apparently similar to the foregoing began, at first with no constitutional disturbances. It was followed by the appearance of erythematous patches with some arthritic symptoms. The symptoms soon became extremely periodic in character. There was disturbance of the digestive tract and fever. The point of chief interest is that when other treatment had proved entirely unsatisfactory, the administration of orange-juice was followed by improvement, and ultimately by complete relief from the condition. **The attacks occurred regularly every seventh day in this case.** The occurrence of **hemorrhages from the mucous surfaces** was also of some interest.

Hochheimer² reported to the Berlin Medical Society a case of **morbus maculosus Werlhofii**. The disease had begun with an angina, and a week afterward there was marked swelling of the arms and legs, without joint disease. After this an extensive purpura appeared. When admitted, the patient was stupid, showed numerous ecchymoses, had bloody vomiting, and passed bloody stools, but there was no fever. There was a slight leukocytosis, and the blood contained streptococci that were pathogenic for animals. Adrenalin was used, and the patient recovered; but during convalescence he had an otitis media and nephritis.

DISEASES OF THE CARDIOVASCULAR SYSTEM.

METHODS OF EXAMINATION.

F. A. Hoffmann,³ in discussing certain practical points in the examination of the heart, states that his use of x-ray examination has convinced him of the value of this measure for scientific purposes, but has also led him to the belief that **for practical purposes percussion is a very accurate means** of outlining the size of the heart. He notes the **importance of percussing down the sternum**, in order to avoid confusion from the sternal tone and to determine accurately the situation of the heart-dulness on the sternum. He considers that when one finds a line of absolute dulness on the sternum at the level of the fifth costal cartilage, the heart is not enlarged; when this line is at the fourth costal cartilage, the heart may be enlarged; and that when the line is above this point, the heart is certainly enlarged. The situation of the **dulness varies greatly in relation to the physical conformation of the patient**, short, thickset persons having the dulness higher. In such persons it may reach the fourth cartilage. The Röntgen rays have shown that this is due to a lateral position of the heart, bringing a greater portion of it close

¹ Practitioner, Sept., 1903. ² Zent. f. inn. Med., Jan. 9, 1904, p. 33.

³ Deut. med. Woch., April 21, 1904.

to the chest-wall. The author finds the phonendoscope valuable in some instances for the purpose of examining the lungs, but in examining the heart he prefers the stethoscope. A phonendoscopic determination of the size of the heart is useful in estimating the limits upward and to the left, but he has not been satisfied with it in determining the right-side limit. The condition of the skin influences this method very largely. Hoffmann gives an interesting discussion of the **changes in the intensity of the heart-sounds**, as distinguished from murmurs. A loud first sound at the apex is not always associated with increased blood-pressure. It is usually found in exophthalmic goiter, in nervousness in general, in mitral stenosis, and in valvular heart-disease. In the latter it is a sign of disturbed compensation. The author thinks it is of **little importance as a symptom of arteriosclerosis**. The first sound may be very weak at the apex in myocarditis, synechia, or effusion into the pericardium; and in mitral insufficiency, any form of disturbed compensation, and fatty heart. The second sound at the apex may be very marked when the second sound at the base is loud, or it may seem very marked when the first sound at the apex is weak—as in fatty heart. A striking weakness of the second sound at the apex may be due to myocarditis or to pericardial synechias and effusions. With this, the first sound may be very weak. Sometimes the first sound is very loud at the base but not at the apex. This condition needs further investigation. Extreme weakness of the first sound at the base is dependent upon weakness of the first sound at the apex. Loudness of the second sound at the aortic area indicates overaction of the left ventricle. The author considers this to be frequent and marked in many instances of stenosis of the aortic orifice. While the peculiar ringing quality of the second sound at the base is not in itself a definite sign of arteriosclerosis, it indicates abnormal tension of the wall of the aorta and justifies a suspicion of arteriosclerosis. If the aortic second sound becomes very weak, and the second pulmonary sound likewise, in infectious diseases, it indicates great weakness of the heart, and is, therefore, a bad sign. Marked weakness of the second pulmonary in mitral valvular disease indicates imperfect compensation. Marked weakness of the sounds at the base, as compared with those at the apex, indicates an alcoholic heart. Marked weakness of the sounds at the apex, as compared with those at the base, shows a fatty heart. [The paper is very interesting. It might well be closely read by that large class of careless observers who will persist in making murmurs almost the sole object of an examination of the heart.]

F. Rosenfeld¹ discusses various methods for **determining the outlines of the heart**. Among other matters, he states that he considers Runeberg's method an accurate one. This consists in very light percussion while one auscults over the organ. Smith's method of ausculting with a modified phonendoscope, and stroking the chest-wall at the same time with a pencil-brush, Rosenfeld believes, gives absolutely the outlines of the heart; but he considers it ridiculous to attempt to outline the various cavities of the heart, as Smith does. Rosenfeld also notes

¹ Berl. klin. Woch., Jan. 11, 1904.

that with changes in the position and the pressure of the phonendoscope, changes in the tension of the skin, etc., errors readily occur.

De la Camp,¹ in discussing certain recent methods of determining the size of the heart, refers to the **orthodiagraphic method** and discusses the results obtained with it. He finds that in picturing the shadow on the anterior chest-wall the size of the heart is somewhat shortened as compared with its actual size; because the long axis of the heart does not lie parallel with the anterior chest-wall, and because this wall is not flat. This method, however, is sufficient to show accurately whether changes in the size of the heart have occurred, and it indicates that the heart-shadow does not enlarge vertically without also enlarging horizontally. The author finds that after exertion in gymnastic exercise, up to the point at which the subject becomes dyspneic and cyanotic, and also after hot baths and the use of alcohol, no enlargement such as that described by Schott occurs, **unless the heart-muscle is diseased**. In convalescent, anemic, cachectic, and febrile patients, and in those with cardiac and pulmonary disease, exertion up to the point of rapid exhaustion does not produce any noteworthy enlargement of the heart. De la Camp believes that the determination of the size of the heart by means of transsonance, using friction-methods, etc., is unreliable. He has been unable, by this method, to obtain figures corresponding with those obtained by percussion or the orthodiagraphic method. The acoustic phenomena obtained by these methods, he believes, depend upon factors other than the size of the heart.

G. Gärtner² has devised a **method of measuring the pressure in the right auricle**. This method is dependent upon observation of the veins of the hand when the arm is raised and emptied, and the determination of the level of the point at which the veins fill and empty. He gives the details of this method at length, and concludes that it is an accurate way to determine the pressure in the right auricle; and that thus it is possible to measure the extent of congestion in the right heart. He also thinks that one can by this method **follow the course of cardiac disease accurately**, as well as the effects of treatment.

O. Prym³ believes that there are **serious objections to this method**; and that, while it is probable that it may have some clinical value, one should remember that the veins cannot be considered to be simple manometers. There is a varying amount of pressure in the veins, and a varying volume of blood passing through them. The tonus of the veins changes frequently; consequently, the results are subject to serious errors. Prym has observed that the vein-phenomenon of Gärtner takes place **at different heights in the same individual** in different veins; also that the rapidity with which the arm is raised causes a marked variation in the height at which the vein-phenomenon occurs.

H. E. Wetherill⁴ describes a **new stethoscope**, the chief point of which is the fact that it has two bells, so that one may coincidentally listen over two parts of the chest. There is also an appliance attached to each bell,

¹ Therap. d. Gegenw., Aug., 1903. ² Münch. med. Woch., 1903, No. 47.

³ Ibid., 1904, No. 2.

⁴ Am. Jour. Med. Sci., Nov., 1903.

for the purpose of carrying out percussion coincidentally with auscultation.

L. Syllaba¹ discusses **Flint's murmur** and the various theories concerning its origin, leaning toward the view that it is produced by a **relative stenosis of the left auriculoventricular orifice**. He describes several cases in which this murmur was heard, considering that insufficient attention has been given to it in German-speaking countries. He also notes that in several cases, after having given digitalis and after the heart-action had become better generally, the Flint murmur disappeared. He also refers to one case in which the murmur could be heard only when the patient was lying down, and never when he was standing; probably because of the increased blood-pressure in the latter position. As a rule, the **compensation is worse when this murmur is present**; but no prognosis can be drawn from the presence or the absence of the murmur, as the conditions are too irregular. The author also discusses the **systolic murmur often heard at the apex in arteriosclerosis** and the various opinions that have been expressed as to the cause of this murmur. He decides that it may have both an anatomic and a functional cause: viz., that it may be due to lesions of the valves produced by arteriosclerosis, or merely to dilation of the heart. As an example of an extreme degree of the functional conditions that produce this murmur in nephritis, he mentions a case in which one could hear a gallop-rhythm, and could also palpate this rhythm with the utmost readiness. The **diagnosis between functional murmur and organic valvular disease in nephritis** depends chiefly upon whether the pulse is small and soft, or tense; whether the right or the left heart is dilated; whether the pulmonary second sound or the aortic second sound is accentuated; and whether the blood-pressure is increased or not; also upon the history and the microscopic examination of the urine. Syllaba likewise discusses **relative insufficiency of the semilunar valves**. He believes that in many cases that have been put in this class, particularly those described by Rosenbach, the murmur has probably been due to partial insufficiency; that is, to slight disease of one valve. When, however, a postdiastolic murmur is a temporary phenomenon that shows itself with some periodicity, the author believes that it is usually due to actual relative insufficiency of the aortic valves. He also refers to **pseudopericardial murmurs**, describing several classes of these, which are chiefly those due to serofibrinous perihepatitis, those caused by extra-pericardial mediastinitis, and a group that cannot definitely be placed in either of the classes just mentioned. Pericarditis may usually be excluded in the diagnosis of these cases by carefully observing the situation of the pseudo-friction-sound, and by noting that the symptoms of pericarditis are absent. In such cases one should be careful to avoid making an unfavorable prognosis. [These "pseudopericardial murmurs" are important and not infrequently cause error, even when carefully studied.]

G. Galli² discusses the **origin of musical heart-murmurs** and reports

¹ Zeit. f. klin. Med., Bd. 1, Hefte 5 u. 6.

² Deut. med. Woch., Jan. 7, 1904.

a case in which there was a systolic murmur of strikingly musical character, which could be heard even when the ear was not placed against the chest. Coughing, the condition of the stomach, breathing, or holding the breath had no influence upon the murmur, nor did the time of day influence it. There was a marked systolic thrill. The cardiac dulness was enlarged. The patient died of cardiac insufficiency and pulmonary edema; and postmortem examination showed marked arteriosclerosis, dilation and hypertrophy of the heart, thrombosis at the apex, and an aberrant papillary muscle. The latter ran from the wall of the ventricle to the main bundle of the anterior papillary muscle, near the apex. The left ventricle in this region was practically divided by the papillary muscle and the aberrant papillary muscle into two lower cavities, the one on the left being larger than that on the right. The latter was behind the aberrant muscle, and the cavity behind the muscle was largely produced by the result of the contraction of the old scar in the heart-wall. As the result of this conformation of the left ventricular cavity, the **blood would pass sidewise over the aberrant muscle** into the abnormal portion of the cavity. There was no other cause for the murmur to be found; and it was decided that in this case it must have been due to the aberrant muscle-fiber. The author concludes, therefore, that it is possible that such aberrant muscles may produce a murmur, even when situated very near the apex.

J. J. Putnam¹ discusses the **nature and causation of the cardiopulmonary murmur**. He insists that it is heard chiefly, if not exclusively, among neuropathic constitutional asthenics and tuberculous patients. He states that among 400 private patients he has heard this murmur in 30, at least 26 of whom **belonged to the neurasthenic group**. Twenty-six of the 30 were men. The author refers to the fact that patients of this sort are likely to have defective cardiac innervation, with irregular, tumultuous, rapid, or changing rhythm. The chest-wall is likely to be unduly yielding, often long, and poorly provided with muscles; and not infrequently tuberculosis is present in the lungs, or the lung may be abnormally placed with relation to the heart. Cardiopulmonary murmurs, however, are heard too infrequently to indicate that there is any essential relation with any particular signs or symptoms. Putnam thinks that it is one of the peculiarities or stigmata so often found in neuropathic persons. He particularly refers to the fact that it is in just such persons that one so often finds ptosis of the abdominal viscera. He believes that some abnormality or defect in the innervation, by means of which the action of the heart is brought into relation with that of the lung, is at fault.

W. L. Ascherson² describes a case in a man 28 years of age, in which, during life, there were very obscure signs, suggesting both uremia and some intrathoracic condition. The point of chief interest was the **apparent evidence of stenosis of the pulmonary artery during life**, while the postmortem examination showed this to have been absent. There was an enlargement of the dulness at the left upper portion of the pericardium, with systolic pulsation and a strong thrill, and with an extremely

¹ Boston M. and S. Jour., July 2, 1903.

² Lancet, Sept. 26, 1903.

loud and abrupt second sound, and a striking diastolic shock. The postmortem examination showed chronic nephritis and hypertrophy of the heart, but no explanation for the murmur—unless the following two conditions may have had something to do with it: first, that the **heart was rotated** after a manner that would permit of the easier compression of the pulmonary artery by the heart itself; and, second, that the **septum was very much hypertrophied**, and bulged into the cavity of the right conus arteriosus. The author discusses the occurrence of murmurs of this kind and the literature concerning them.

M. Solis Cohen¹ refers to 6 cases in which he observed a peculiar **xiphosternal crunching sound**, which was superficial, and resembled that caused by a boot treading upon soft snow. It was heard over the lower end of the sternum and a little to the left of it, and varied in intensity. Its intensity was not influenced by exercise, respiration, or pressure, but increased when the patient leaned forward and diminished when he lay down. In each case the heart was enlarged. The author reports the cases in detail and reviews the literature, reaching the conclusion that the sound is probably produced in several ways; but that in some cases, at any rate, it is due to the presence of **white patches on the pericardium**.

B. F. Stahl² discusses the **relation between tabes dorsalis and valvular heart-disease**, and reports 24 cases that he has studied at the Philadelphia Hospital. Eleven of these patients have since died; and in 7, the postmortem conditions were observed. The author found normal sounds at the mitral area in 4 cases, and normal sounds at the aortic area in 5. There was a mitral systolic murmur in 6; a mitral presystolic, in 3; a double mitral, in 1; an aortic systolic, in 5; an aortic diastolic, in 2; and an aortic double murmur, in 2. There was evidence of arteriosclerosis in all but 3 cases. Six of the patients were over 40 years of age. Of those that died, 3 had myocardial change; 4, atheroma; and 3, disease of the valves. The author believes that disease of some part of the circulatory system is present in nearly all cases of advanced tabes; that valvular heart-disease is present in a large percentage; and that the **close relation between syphilis and tabes** makes it probable that syphilis causes a large proportion of the heart-lesions found in association with tabes.

Schuster³ considers **syphilis of the heart to be a comparatively frequent condition**. He refers to the fact that it usually affects the aortic orifice; and, of course, the aorta itself. In the cases that he has recently observed he has had 22 instances of tabes; and 3 of these showed aortic insufficiency. All had had syphilis, and no other cause of either the tabes or the aortic insufficiency could be discovered. The author believes that syphilis was responsible for the cardiac disease, as well as for the tabes.

L. Feilchenfeld⁴ insists upon the importance of **disturbance of the circulation in the production of insomnia**. The most striking form of insomnia due to circulatory disturbance is one in which the patient

¹ Am. Jour. Med. Sci., July, 1903.

² Amer. Med., Nov. 14, 1903.

⁴ Berl. klin. Woch., March 14, 1904.

³ Deut. med. Woch., Oct. 8 1903.

falls rapidly asleep, but wakes after an hour or two, usually with a feeling of anxiety and thoracic oppression, and often with palpitation. This is followed by a more or less prolonged period of wakefulness. These patients usually show weakness of the heart-muscle, not by any means necessarily associated with any definite organic lesion. He insists upon the importance, in the treatment of these cases, of using very small doses of narcotics, small doses often acting better than large ones; also of giving with these, small doses of digitalis or of some other cardiac tonic. [We heartily assent to the view that functional circulatory disturbance is a prolific cause of insomnia—and of various neurasthenic symptoms.]

C. Bolton¹ has made an experimental study of the **disturbances of compensation of the heart in relation with dropsy**. He constricted the pericardium with ligatures, etc., in order to interfere with the complete filling of the cardiac chambers. In cats he was able to produce in this way the picture of disturbed compensation, with all the main symptoms, including dropsy. The latter appeared first in the serous cavities. It also produced a reduction in arterial pressure and an increase in venous pressure; but the latter soon fell to normal, probably as the result of a stretching of the veins. At this period there was reduced arterial pressure with normal venous pressure; consequently the capillary pressure was reduced and the current was slow. In the capillaries of the liver alone the pressure was normal. In normal animals, after the ligature had been removed, the arterial pressure became normal; but if the condition had gone on to the production of dropsy, the blood-pressure remained low. The author decides that **dropsy is due to damage of the capillary walls**, and not to excessive secretion of the endothelial cells.

J. Esser² discusses the cause of the **right-sided hydrothorax** that occurs in cardiac disease, particularly referring to 3 postmortem observations. He found on the right side marked enlargement of the bronchial glands and of those about the hilus of the lung. These glands were very hard. Some of them compressed the main bronchus, and others could be followed well into the interior of the lung. The author believes that the chief reason that disease of the heart so readily produces pleural effusion is that in this disorder there is such a **strong tendency to lymphatic stagnation**; and that the fact that this occurs particularly on the right side is due to the very complicated lymph-current on that side. The current on the left has an easy outlet, while the contrary is true on the right; consequently on the right side there is a marked tendency to lymphatic stagnation and exudation into the pleural cavity. [J. D. Steele's view that it is caused by compression of the right azygos vein is certainly equally credible.]

T. L. v. Criegern³ contributes an interesting report of a case with peculiar vascular disturbances; these, he believes, being probably the result of nervous disorder. The most striking point in the case is that

¹ Jour. of Path. and Bact., Aug., 1903.

² Münch. med. Woch., 1902, No. 44.

³ Deut. med. Woch., July 16 and 23, 1903.

petechias appeared in areas quite accurately localized to certain of Head's spinal segment-zones. After an extensive discussion of the meaning of these petechias the author decides that it is improbable that they were due to emboli, because of their limitation and on account of the absence of other reasons for considering them due to emboli. He refers to the fact that Raynaud's disease has been observed in nervous affections, such as tabes, syringomyelia, and tumor of the cord. His patient, also, presented symptoms resembling Raynaud's disease, and likewise had epistaxis and menorrhagia. He believes that all the vasomotor symptoms observed in this case can probably be brought into relation with each other. They were all of the **type of vascular spasm**. He also thinks that in consideration of the fact that hemorrhages into the skin, of the same character as the petechias in morbus maculosus, may be distributed in conformation with Head's segments, just as occurs in herpes zoster; and in consideration of the further fact that Raynaud's syndrome and other evidences of vascular disturbance may occur together and apparently be due to the same cause, there should be a more extended study of the relation between such vascular disturbance and disease of the nervous system.

Pässler and Rolly¹ contribute an extensive experimental study of **disturbances of the circulation in acute infectious diseases**. After criticizing the methods that have been used, they describe the procedure that they have adopted in this study, which consists in a combination of those of Romberg and Pässler and of v. Stejskal. The authors give many details; and their conclusion is that they have practically confirmed the previous statement of Romberg and Pässler, which was to the effect that disturbances of the circulation occurring in acute infectious diseases are **due to paralysis of the vasomotors**, the heart not being especially involved in the collapse that occurs with marked reduction in the blood-pressure. In pneumococcus infection increased work of the heart for some time compensates for the vasomotor disturbance. This is also true of the condition in diphtheria, though there may be some differences in the two infections. The weakness of the heart that finally appears is not due to direct damage of that organ by the infection itself, but is a secondary result of the vascular paralysis. There is, however, after a prolonged period of latency, some direct influence upon the heart in diphtheria; but this is a different condition from the one that v. Stejskal described. It is not a primary, immediate effect of the diphtheria-toxin. **Direct damage of the heart could not be observed** in the poisoning of a pneumococcus toxin. These results correspond very well with the pathologic finding that pneumonia hearts usually show no changes, while the diphtheria heart is likely to show fatty and other alterations. [Studies of this character are extremely welcome to the clinician in relation to treatment. Clinically there seems little doubt that failing blood-pressure in pneumonia is best maintained by measures that influence the arteries rather than the heart.]

¹ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 1 u. 2.

Heitle,¹ also, discusses **reflex depression of the pulse**, amplifying his previous observations, and describing many detailed methods by which one may produce an increase or a decrease in the amplitude of the pulse-wave, by pressure and blows over the most varied regions of the trunk and the extremities. Slight irritation, such as stroking, causes an increase in the pulse-wave, while strong blows or pressure cause a decrease.

Heitler,² also, in connection with his previous observations concerning the influence of opening and closing the eyes, and of the excitation of other senses, upon the pulse, describes a series of observations that he has made, demonstrating the **influence of excitation of hearing, taste, and smell upon the pulse**.

Heitler³ further presents a **sphygmogram** taken from a young girl while in a **prolonged fit of laughter**. During the laughter the cardiac sounds, which had previously been normal, became frequent and irregular; and the second aortic sound increased in strength. After the laughter had ceased the auscultatory sounds were normal. The author refers to the fact that patients with cardiac trouble often state that laughter makes them more or less uncomfortable, and says that in one case he has seen severe, almost fatal, collapse follow a fit of laughing. In a case in which the pulse-curve was taken it was found that the heart was normal, but that during laughter the pulse showed a very high grade of arrhythmia. In part the curve was similar to that found by the author in experimental irritation of the vagus. In a convalescent patient another pulse-curve was taken during moderate laughter. The pulse-curve rose during the laughter, but the pulse showed no other noteworthy change.

IRREGULARITIES IN RHYTHM.

O. Reissner,⁴ after discussing a series of cases, reaches the conclusion that the theory of the **myogenous origin of cardiac activity** is entirely in consonance with the view that irregularity of the pulse may occur through nervous influences in persons who are especially excitable; this being shown particularly by a study of pulse-curves taken at the onset and during the course of irregularity; and by the disappearance of the irregularity as the result of psychic influences. These cases, he thinks, are **not due to irritable weakness of the heart-muscle**. The nervous influences act partly through the production of cardiac stimuli and partly through the direct effect upon the irritability of the heart-muscle.

J. Mackenzie⁵ presents a series of observations of cardiac cases in connection with sphygmograms, which indicate, he believes, that irregularity of the heart, when continuous, is **due to the ventricles' taking on the inception of the rhythm**. The cause of this is an **abnormal irritability of the heart-muscle**, not disturbance of the nervous system.

¹ Zent. f. inn. Med., Jan. 9, 1904. ² Zent. f. inn. Med., April 23, 1904.

³ Zent. f. inn. Med., Jan. 9, 1904.

⁴ Zeit. f. klin. Med., Bd. lili; Riegel Festschrift.

⁵ Brit. Med. Jour., March 5, 1904.

These conclusions were reached particularly through observing the jugular pulse and noting that the auricle maintains its regular rhythm during the irregular period of the heart.

J. Mackenzie¹ reports the case of a woman of 24 who had mitral insufficiency and was seen for cardiac disturbance in the course of pregnancy. The case is discussed particularly in reference to the study of the pulse, the radial and jugular curves being observed together. He believes that these curves demonstrate that there was a **disturbance of the conductivity of the heart**. He notes that in this case digitalis did harm, this agreeing with Wenckebach's view that **digitalis is likely to do harm in disturbance of conductivity**. Mackenzie believes that by similar studies it may be possible to reach some very important conclusions concerning the therapy in cardiac conditions, as well as the diagnosis and the prognosis.

O. Pan² reports a case in which there were **ventricular extra systoles without compensatory pauses**. The cardiac systoles were slow, and there occasionally occurred extra contractions, but no corresponding pauses. The occurrence of such extra systoles without compensatory pauses in cases in which there are slow contractions harmonizes, the author thinks, with the physiologic observations concerning the effect of irritants upon the heart, and with the theories concerning the occurrence of arrhythmia in the course of human disease that have been built upon these observations.

E. Rehfisch³ contributes an interesting discussion of **nervous and organic cardiac arrhythmia**, based upon a large series of normal persons with functional and organic disturbances of the nervous system, and a further series of persons who showed undoubted cardiac disease. One hundred normal persons showed in only 4 instances undoubted irregularity of the pulse; but the differences in the pulse were in all cases below 25 % with one exception, in which the difference was 31 %. Such a difference cannot be appreciated by the examiner, except by careful analysis. He also noted 100 persons with functional nervous disorders, such as neurasthenia, chorea, hysteria, and traumatic neurosis. The result was very much the same as in the normal persons, except that 2 showed differences between 26 % and 30 %; and 2, a difference of 31 % to 36 % in the various pulse-curves. Only 8 showed a difference of over 20 %. There was also a series of cases in which there was probably irritation of the vagus; these all showed a difference below 35 %. A series of persons that had disturbance of rhythm following acute infectious diseases showed a difference of the pulse-curves as great as 58 %. The cases that exhibited definite cardiac disease showed differences as great as 120 %; and only 5 out of 47 showed less than 20 %. This, Rehfisch believes, indicates that **a difference of over 40 % is extremely rare in normal persons** or in those with merely nervous conditions; while when the heart is definitely diseased, the difference in the pulse-

¹ Deut. med. Woch., June 9, 1904.

² Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 1 u. 2.

³ Deut. med. Woch., Mar. 10 and 17, 1904.

curves is usually more than 40 %. He thinks, therefore, that when marked irregularity of the pulse occurs in neurasthenics, it is **probably due to actual disease of the heart**; and that one is not justified in calling cardiac irregularity a functional condition, when the irregularity is decided. He considers that this view is supported by some observations made by him with neurasthenics before and after effort. Those in whom he suspected cardiac insufficiency showed evidences of heart-weakness after this, with a small, weak pulse and a low curve; while the others showed a marked change in the pulse after exertion, but the curve became higher and more forcible. He believes that extra systole cannot be produced through simple nervous influences. The most important conclusion reached by him is that **organic arrhythmia can be distinguished from nervous arrhythmia** by the fact that the differences between the various pulse-periods are much greater in the cardiac than in the nervous cases; and that when there is a very marked difference between the periods, one should suspect the cardiac origin of the disorder. [So important a conclusion needs extensive confirmation. It will be seen that the following paper takes the contrary view.]

P. Reckzeh,¹ in discussing irregular pulse, states that as yet it is impossible by modern methods to distinguish between the intermissions of the pulse due to nervous conditions and those due to toxic or organic lesions, whether the latter be myocardial changes or valvular lesions. He opposes Rehfisch's views. Reckzeh has made a study of over 100 cases of intermittent pulse with the Jaquet instrument. He finds that the intermissions are not always felt by the patients, even when the latter have had their attention directed to them. It is also sometimes difficult to hear extra systoles when ausculting. Bigeminal pulse may be produced by any disease of the heart-muscle or of the valves, and also by nervous conditions, poisons, etc.; in other words, by anything that disturbs the proper relation between heart-power and heart-strain. It is very common in neurasthenics, particularly in those with marked vasomotor irritability or in those with atonic stomachs. Reckzeh does not believe that the observation of the occurrence of Lucian's periods indicates definitely that the conductivity of the heart is disturbed. He believes that one may determine clinically what Hering has observed experimentally, viz.: that with increasing frequency of the pulse the refractory phase of the heart becomes shortened. He also finds clinically that a **bigeminal pulse produced by disorder of the ventricle corresponds with two normal pulse-periods**, while such a disturbance produced at the venous sinus always shows the period shortened; when it is produced in the auricle, the period is usually shortened. An example of the latter, for instance, is that in tricuspid insufficiency the causal disturbance is usually in direct relation with the number of extra systoles observed. Reckzeh particularly notes that **digitalis is itself capable of producing extra systoles**; and in conditions of this kind it is decidedly contraindicated. Instead, one should use **measures that tend to quiet the irritability of the heart**; such as rest, hydrotherapy, narcotics, and nervines.

¹ Deut. med. Woch., Mar. 3, 1904.

F. Riegel¹ discusses **cardiac hemisystole and cardiac bigeminal action**. He particularly replies to v. Leyden, maintaining his previous position that v. Leyden was wrong in considering the case described by him as hemisystole to be such. Riegel discusses the sphygmograms, as well as the clinical descriptions of cases that have been called hemisystole, and reaches the positive conclusion that in all those cases in which the descriptions are sufficiently accurate there are evidences that the second systole occurred too early; that is, that there were extra systoles followed by a longer pause than the previous pause. This indicates that it was **not hemisystole, but was due to extra systole**. The mere fact that no pulse can be demonstrated in the artery with the second phase of the heart-impulse does not by any means truly indicate that at this time there is no contraction of the left ventricle. In many of the cases studied there was actual trigeminal action, and this is difficult to associate with the idea of a hemisystole. Bigeminus is not a rare functional disturbance of the heart. This is a condition that, like that described by v. Leyden, is often produced by digitalis.

H. E. Hering² discusses pseudo-hemisystole and postmortem hemisystole. There are **two forms of hemisystole to be observed**. In the first one ventricle beats, while the other ceases beating; in the second one ventricle beats more frequently than the other. The first form **occurs only at the time of death**, in spite of the general belief that it may come within the period of clinical observation. The second form, the author says, has **never been seen except in the dying heart**; and the anatomy and the physiology of that organ both indicate that it cannot occur in any but a dying heart. The condition that has been called hemisystole is really not hemisystole at all, but is the condition that Hering prefers to call **pseudo-hemisystole**. It is possible for the auricles to beat more rapidly than the ventricles, and this may give rise to the clinical impression that hemisystole is occurring. There is a general clinical impression that the dropping of a beat by one ventricle is relatively a less marked disturbance than the dropping of a beat by both ventricles. As a matter of fact, the author considers that the former never occurs, except at the point of death; while it is **not uncommon for the auricles to beat without any contraction of the ventricles**. He thinks that the terms hemisystole and alternating systole should be dropped entirely from clinical terminology: the first, because it does not come under the observation of the clinician; and the second, because it never occurs at all.

E. Reichmann³ gives a brief historic discussion of the **literature concerning pulsus paradoxus**, in order to demonstrate that this sign occurs in the most varied circumstances. He also discusses its cause, and believes that it can regularly be referred to the fact that in inspiration there is a reduction of intrathoracic pressure, which results in **dilation of the aorta**. The consequence of this is that more blood is held up by

¹ Deut. med. Woch., Oct. 29, 1903.

² Deut. med. Woch., 1903, No. 22.

³ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

the aorta at the moment of the beginning of the pulse. Consequently, **less blood escapes to produce the pulse** in the peripheral arteries. He considers the diagnostic importance of *pulsus paradoxus* to be very slight, unless associated with an inspiratory swelling of the veins of the neck. In that case, however, the last-mentioned sign is the one of real importance, and not the *pulsus paradoxus*. [Whatever the importance of Reichmann's theory, it is clearly true that *pulsus paradoxus* is of far less importance in specific diagnosis than it has been widely thought to be.]

A. Hoffmann¹ discusses some new observations concerning **paroxysmal tachycardia**, and reports 5 cases. Röntgen-ray examination has convinced him that he is correct in believing that the paroxysm is **not associated with cardiac enlargement**. The frequency of the pulse was regularly found to be **double its frequency previous to the attack**. This fact he believes indicates that normal irritation of the heart would produce double the frequency of the normal pulse, were it not that, owing to some control, only half of these irritations produce an impulse. **In cases of tachycardia the heart responds to each irritation**. The hearts of patients with tachycardia at times show insufficiency, as indicated by the occurrence of attacks of abnormal slowing of the pulse in one patient. In this case the pulse dropped to about half the normal frequency; but with the attack of bradycardia, as with the attacks of tachycardia, the author could distinctly determine the occurrence of *pulsus alternans*. All these patients showed frequent extra systoles in the midst of normal pulses. Hoffmann has followed a number of patients. He notes that one man, whose attacks had begun in his fifty-eighth year, was still living and perfectly healthy at the end of 61 years; that another, who had had attacks since his early youth, was 52 years old and well; and that in another the attacks disappeared. Many of the patients, by immediately performing manipulations of various kinds,—such as lying flat and taking deep breaths, pressing on the course of the vagus, etc.,—were **able to abort the attacks in the beginning**.

A. Hoffmann² also reports a case of paroxysmal tachycardia in which he had an opportunity to take **tracings at the time of the onset of the attack**, as well as during the attack and when it was ceasing. He discusses these tracings at length, and particularly refers to the fact that they demonstrate that in paroxysmal tachycardia the normal rapidity of the heart is doubled or quadrupled. This condition bears **no analogy to ordinary tachycardia**. Hoffmann believes that these facts indicate that the seat of disturbance lies in a region above that in which the normal heart-rhythm takes its origin. He also thinks that paroxysmal tachycardia **cannot be considered to be of such ominous prognosis** as would be the case were the earlier theories of its causation true. The causes may be varied, and therefore the prognosis is also varied; but the **heart-muscle may be perfectly normal**, in which case the prognosis is excellent. A patient who had had attacks for 50 years without any disturbance of health is mentioned.

¹ Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 1 u. 2

² Zeitsch. f. klin. Med., Bd. liii, Riegel Festschrift.

J. Thomayer¹ discusses **orthostatic tachycardia**. He finds **no previous satisfactory explanation** for the rapidity of the pulse that occurs upon assuming the upright posture, this difference being sometimes very marked. He describes a case of gonorrheal cystitis in which the pulse when the patient assumed the horizontal position was below 90, but ran as high as 168 when he was upright. The condition was much improved after treatment of the cystitis. In a case of phosphorus-poisoning the pulse, upon the patient's assuming the vertical position, rose from 90 to 140. After improvement in the primary disease the difference was only from 82 to 100. In a case of pulmonary tuberculosis the rise in the pulse was from 84 to 168. In the first case the blood-pressure was the same in both postures, and in the other two cases it was higher when the patient was lying down. The author believes that a toxic disturbance of the vagus-center is not sufficient to explain the influence of change in posture, and thinks that the changes are **due to the pressure of the cerebrospinal fluid** upon the medulla. This pressure is less marked in the vertical posture, because the fluid sinks downward. In such circumstances, therefore, there is less stimulation of the vagus-center, and the pulse becomes more frequent. Thomayer has found that if the foot of the bed be raised, so that the cerebrospinal fluid will gravitate toward the brain and thus increase the pressure upon the medulla, the pulse will become still slower than in the ordinary horizontal position.

R. J. Blackham² refers to the question as to the frequency of **bradycardia in normal persons**, leaning to the view that it is a very uncommon condition. He mentions a soldier, 40 years of age, who was in excellent physical condition in every way except for a mild dyspepsia. His pulse ran regularly at about 45 per minute, and was but slightly increased by exercise. His dyspeptic symptoms rapidly disappeared under treatment, but his pulse remained about the same throughout 18 months' observation. The author thinks that such cases are quite rare.

W. Osler³ gives a general discussion of the so-called **Adams-Stokes disease**. The conditions in which a slowed pulse is met with he classed as physiologic, neurotic, toxic, cardiac, and cardiovascular. The varieties of Adams-Stokes disease are **postfebrile, neurotic, and arteriosclerotic**. He mentions among others a striking case of the first variety that occurred in a man of 35 with a profound attack of collapse, in which the pulse sank to 20 in the minute. The patient entirely recovered. The cases in this group are more favorable than are those in either of the other groups, but even these are very dangerous. The neurotic cases may show coarse lesions of the nervous system or they may not. The majority of the cases are found in the arteriosclerotic group. The author reports 12 cases, all in male subjects. Five had very severe and acute symptoms, 4 were senile cases, 2 were of a mild form in younger men, and 1 followed a streptococcic infection. These cases are described in detail. In discussing the general features of the disease, Osler refers to the fact that all the cases except the one with an acute postfebrile attack exhibited

¹ Sbornik klinicky, Bd. iv, p. 375; Zent. f. klin. Med., Jan. 9, 1904, p. 30.

² Lancet, Aug. 22, 1903.

³ Lancet, Aug. 22, 1903.

arteriosclerosis. The heart did not show marked enlargement in any case. Cardiac murmurs were heard in 5 cases and the sounds were weak and muffled in 2. In 1 case that came to autopsy a high grade of sclerosis with calcification of the heart, the aorta, and the coronary arteries was found, and the left ventricle was hypertrophied. As a rule, **the valves are found normal in this condition.** The author particularly emphasizes the importance of making a distinction between true bradycardia and false bradycardia, in which the heart-rate is not the same as the pulse-rate. The latter condition is frequently observed in this state. In some cases one may definitely determine that there are abortive heart-sounds that produce no pulse. It is possible that heart-block, with auricular contractions unaccompanied with ventricular contractions, may be an important feature of the Adams-Stokes syndrome. One of the most striking features of the syndrome ever observed is the **cardiac arrest** which may persist for half a minute or more, and seems, for the time, like death. The vasomotor system shows marked changes. The **nervous symptoms** are those that usually lead the patients to seek relief. They consist chiefly in attacks of vertigo, syncopal attacks, pseudoapoplectic attacks, and epileptic seizures. **Pulmonary features** are often seen, such as cardiac asthma, angina sine dolore, and acute emphysema—or perhaps, more properly, acute edema of the lungs. The pathology of the condition cannot be rationally discussed, as we know too little about it. The outlook in the disease is always bad, but is more satisfactory in young than in old persons. It may, however, last for many years. Sudden death is the most common ending. If there is any history of syphilis, antiluetic treatment should be tried; and if the tension is high, nitrites should be used. In most cases, however, it is best merely to keep the bowels open and to put the patient on a limited diet. Diffusible stimulants should be given in syncopal attacks. The epileptiform and the pseudo-apoplectic attacks may sometimes be prevented by giving stimulants or amyl nitrite; but treatment is, as a rule, unsatisfactory.

J. W. Watson¹ reports an interesting case of bradycardia with the Adams-Stokes syndrome. The patient was a man of 18 years. In the 6 months following his first attack his pulse was most of the time below 24, and **repeatedly went down to 18.** He had severe syncopal attacks. An interesting fact is that while his pulse had for a long time been very low, just before his death it rapidly went up to 66, as it had been in health, the patient having been in an attack at this time. It then dropped again to 18, and the man died.

P. Kidd² reports a case of Adams-Stokes disease, and briefly reviews some of the literature concerning this affection. His own case was interesting on account of the occurrence of 2 attacks in which the **pulse disappeared at the wrist**—in one instance, for 40 seconds; and in another, for 90. This patient had no determinable signs of arterial degeneration, but probably had aortic stenosis. It is possible that the improvement shown by her was due to the administration of thyroid extract.

¹ Amer. Med., Mar. 25, 1904.

² Lancet, Feb. 13, 1904.

R. G. Curtin,¹ in discussing bradycardia as a symptom, notes cases in which bradycardia has occurred after influenza and lead-poisoning, and gives a brief report of 4 cases of Adam-Stokes syndrome. In one case that occurred in an inveterate user of tobacco, the bradycardia was associated with attacks of syncope. In another case convulsions occurred, the pulse running as low as 13. A third patient had attacks of vertigo and convulsions; and in the fourth case, also, convulsions occurred.

T. E. Norfleet² describes an extreme case of bradycardia (which was evidently an example of the Adams-Stokes syndrome). The man, 69 years of age, had for over a year had a pulse of 45 or less. He had had alarming attacks of extreme bradycardia, with depression, accompanied with convulsive movements. In these the pulse would stop entirely for as long as 20 seconds. The rate of pulsation sometimes remained **as low as 8 or 9 per minute for 24 hours**, and the pulse was also intermittent. These convulsive seizures were made worse by alcohol. Under treatment, the patient grew very much better.

CARDIAC DILATION.

De la Camp³ contributes an extensive experimental study concerning acute dilation of the heart, carried out chiefly with the aid of the **orthodiagraphic method** of determining the size of the heart, together with that of other clinical methods; and at times confirmed by postmortem examination. These observations consisted in determining the influence of the greatest possible effort upon the heart in normal persons, convalescents from various diseases, neurasthenics, anemic and cachectic persons, those with cardiac disease, etc. He also studied animals, particularly after producing various forms of damage to the heart, after causing embolism and anemia, after using various poisons, and in the course of hunger. He likewise determined the influence of stimulation of the vagus, of postmortem rigidity, and of other factors. His chief conclusion is that **acute dilation of the heart does not occur**, even after maximal effort, **unless the heart-muscle is seriously diseased**. The normal heart dilates but little, if at all. The usual effect of effort is to cause a more extensive and stronger impulse; it also produces changes in the pulse, and these have been incorrectly attributed to dilation. In determining the size of the heart by the Röntgen rays one must take into consideration the position of the diaphragm in particular, and also the condition of the chest-walls.

PERICARDITIS.

J. L. Roberts⁴ reports a case of mediastinopericarditis in a boy 5 years of age. There was a slow, regular pulse, with absence of cardiac murmur;

¹ Amer. Med., Aug. 1, 1903.

² Zeit. f. klin. Med., Bd. li.

³ Med. Rec., Nov. 21, 1903

⁴ Lancet, Nov. 7, 1903.

and yet there was marked edema of the face and hands and severe edema of the trunk and lower extremities. It was decided, therefore, that there was some compression of the main venous trunks near the point at which they empty into the heart. Autopsy showed a **large fibrous mass**, which was in part caseous, situated in the anterior mediastinum and extending somewhat backward. It pressed against the right auricle, the superior vena cava, and the pulmonary veins. In part of the mass pus was present, a comparatively rare observation in such conditions. The author notes that the edema of the **abdominal wall was much greater in proportion** to the amount of ascites than is usual in anasarca from valvular disease, and states that the same thing was seen in another similar case. He thinks it might be a help in determining the existence of intrathoracic obstruction. [We have, however, repeatedly seen similar conditions in pure cardiac disease.] Roberts believes that it might have been feasible to have relieved the symptoms greatly by trephining the sternum and evacuating the contents of the abscess.

A. Doeber¹ contributes some observations concerning **pericarditis and aspiration of the pericardium**, based upon 56 cases, 66 % of which were rheumatic; and the others, of variable etiology. Of the rheumatic cases, 78 % recovered or improved, most of them having recovered. The other forms were of bad prognosis, 79 % dying. Most of them were due to nephritis, tuberculosis, or myocardial weakness, or were metastatic. The pericardium was aspirated in 4 cases. The author particularly notes his experience in regard to the **point of election** in introducing the needle, the most satisfactory point, in his opinion, being the fourth interspace in the right parasternal line, 2.5 to 3.5 cm. to the right of the sternum. Aspiration was carried out only on account of an *indicatio vitalis*.

VALVULAR CARDIAC DISEASE.

Acute Endocarditis.—Fazio² discusses the **apyretic form of malignant endocarditis**, reporting a case in which there was ulceration of the aortic valves and perforation of one of the mitral valves, with dilation of the heart. The clinical condition had corresponded with this. The etiology was undiscoverable. The disease had occurred in a previously healthy person, without any known cause.

L. C. Miller³ reports an interesting case of **malignant endocarditis with meningitis**, which was shown to be due to pneumococcal infection.

Mitral Stenosis.—J. E. Sawyer⁴ considers that **patients with mitral stenosis develop a general edema much later** than do those that have mitral regurgitation. He believes this to be due to the fact that the **hypertrophy of the left auricle in mitral stenosis occurs early** and becomes marked. He also thinks that failure of the left auricle is the chief beginning cause of cardiac dropsy. This explains the late onset of edema in mitral stenosis.

¹ Berl. klin. Woch., May 2, 1904.

² Gazz. degli osped., 1903, No. 29.

³ Boston M. and S. Jour., July 9, 1903.

⁴ Lancet, Jan. 16, 1904.

G. Steele¹ reports 2 cases of **angina pectoris** occurring in patients with mitral stenosis. He objects to the view that angina pectoris does not occur in mitral disease in young persons. He believes that symptoms so entirely similar to it occur in this disease that there is no reason for giving them another name. He also notes the frequent occurrence of precordial pain in young subjects of cardiac dilation—a pain entirely different from angina.

A. Alexander² reports a case of mitral stenosis in which there was **paralysis of the recurrent laryngeal nerve**, reviews the other observations, and reaches the conclusion that in this case the conus arteriosus and the pulmonary artery were dilated; and that the latter, together with the dilated left auricle, caused a pulsatory pressure upon the recurrent laryngeal nerve. It is possible, however, that the condition in this patient was **due to an old pericarditis**.

Aortic Insufficiency.—L. Ferrannini³ has carried out a series of **experiments concerning aortic insufficiency**. He finds that in various degrees of aortic insufficiency the auscultatory signs are in direct relation with the severity of the lesion. Very slight insufficiency produces only an impurity of the second sound. The more marked the insufficiency, the less distinct becomes the recoil-wave in the sphygmogram. The thrill in aortic insufficiency is not due to any constant conditions. It has, however, a tendency to accompany the severe rather than the milder lesions. In experimental aortic insufficiency the changes in the pulse and the auscultatory and other signs in the vessels were similar to those observed in aortic insufficiency in human beings.

W. v. Leube⁴ reports an interesting case as an example of his observation of the presence of **nephritis in aortic insufficiency** in a number of instances, when signs of general cardiac incompetency were absent. Such a condition may, of course, be produced by the coincident presence of nephritis or of true atheromatous induration of the kidneys; and if there is general cardiac incompetency, albuminuria, of course, occurs from congestion and subsequent cyanotic induration—as it occurs in any other form of cardiac incompetency. In the case reported, however, and in other cases the author observed albuminuria, in the absence of cardiac incompetency and of any evidence of venous stagnation, etc., when the amount of urine was not decreased and the specific gravity was still relatively low. The albumin was present in very small amount, and the sediment showed hyaline and granular casts. The examination of the kidneys in this case showed a thickening of the smaller arteries throughout all their coats and some thickening of the interstitial tissue. There was also some epithelial change, and the capillaries of the glomeruli all showed thickening in their walls. The explanation for these changes advanced by von Leube is the irritative **effect of the hammering against the arteries** that occurs in aortic regurgitation. The marked changes in blood-pressure he believes to be sufficient to produce anatomic changes in the kidney. In support of this view he notes that in the case reported

¹ Lancet, Nov. 21, 1903.

³ Zeit. f. Heilk., 1903, Heft 8.

² Berl. klin. Woch., Feb. 8, 1904.

⁴ Münch. med. Woch., July 28, 1903.

there were similar changes in the other organs supplied by the general circulation, particularly the liver and the spleen, while the lungs showed no such change.

W. F. Hamilton and J. R. Byers¹ reported 2 cases in which there was a diastolic aortic murmur having the characteristics of that due to structural change in the valves, while postmortem examination showed **that the semilunar valves were perfectly normal in structure, but that the ring was apparently dilated.** In the first case advanced atheroma of the aorta had been followed by dilation; in the second, there was only flabbiness of the myocardium and anemia. This flabbiness was believed to have given rise to the relaxation at the aortic ring.

CHANGES IN POSITION OF THE HEART.

H. Silbergleit² discusses movability of the heart, and reports a case in which ordinary physical examination and radioscopy both showed that when the patient lay on his left side the heart was almost entirely in the left side of the thorax; and that when he lay on his right side, it was **almost entirely in the right side of the thorax.** He thinks that there is absolutely no question that in this case there was a markedly **abnormal degree of movability** of the heart. This, however, he considers to be an entirely accidental matter, and—in this case, at least—**not of any importance.** This patient had absolutely no cardiac symptoms. In the cases in which cardiac symptoms occur he believes there is, at the same time with the movability, also some actual disease of the heart. This patient had what the author terms chlorosis. [He was a man of 24 years, and the only signs of chlorosis were apparently a reduction in the hemoglobin to 60 %, with normal red cells, and marked pallor.] Silbergleit refers to the statement that has been made that chlorosis has a specific influence in producing cardiac mobility. He thinks that this is entirely incorrect, and that the movability and the chlorosis are due to some common cause.

A. Abrams,³ in discussing **cardioptosis**, divides it into the voluntary form, the form associated with ptosis of the abdominal viscera, the cardioptosis of accommodation, and primary essential cardioptosis. Under the heading of the **voluntary form** he notes the case of a man who could dislocate his heart, stomach, and kidneys at will, and had remarkable control over his diaphragm. Under symptomatology the author states that there are no characteristic symptoms. There may be no symptoms at all or there may be merely a feeling of weight and oppression. There particularly may be a sense of great discomfort or dyspnea during exertion or when leaning forward. The long axis of the heart seems to be parallel with the diaphragm, and the boundaries to be poorly defined. Deep respiration does not bring into view a space between the heart and the diaphragm. In cardioptosis there is little or no respiratory or attitudinal dislocation. Abrams has found no treatment useful except the

¹ Am. Jour. Med. Sci., Oct., 1903.

² Deut. med. Woch., Nov. 19, 1903.

³ Med. News, Aug. 22, 1903.

wearing of a **good abdominal support** with pressure in the upper abdomen.

A. K. Stone,¹ in a general article on the subject of cardiac displacement, concludes from his study of the literature pertaining thereto that almost all the known cases of dextrocardia have been accompanied with the evidences of extensive malformation of the heart, and that **no true case of dextrocardia is on record**, all instances in which the heart has pointed toward the right having been due to pleuropericarditis or other acquired conditions. It is, however, possible for a congenital dextrocardia not of the true mirror variety to be present, and to produce no symptoms of cardiac abnormality. In displacement of the heart due to effusions, etc., the author insists that the heart tends to move as a mass to the right or left. He says that **rotation is very rare**, and, when found, is accompanied with exceptional conditions or is produced by contracting adhesions. Therefore the **visible impulse to the right of the sternum is produced by the base of the heart**, and not by the apex. Stone reports cases to show that extreme displacement of the heart may occur without the slightest discomfort to the patient, and may even take place very suddenly without producing discomfort. The **sudden deaths occurring in large pleuritic effusions are not due to the cardiac displacement** that may be present.

MISCELLANEOUS CARDIAC AFFECTIONS.

G. Daddi² has made a study of **pathologic conditions in the ganglions and nerves of the heart**, especially in relation to the clinical symptoms observed and often attributed to myocardial changes. In 2 patients who died of typhoid fever, one of whom had shown during life a very weak pulse, and the other a normal typhoid pulse, histologic examination revealed in the first ordinary degeneration of the muscle-fibers, together with marked cellular infiltration of the ganglions and swelling and cloudiness of the protoplasm of the nerve-cells; in the second, no changes except slight **swelling of the ganglion-cells**. In 2 cases of hydrophobia conditions similar to those seen in the first typhoid case were found. In 2 cases of pneumonia with more or less marked signs of cardiac weakness there was degeneration of the ganglion-cells with vacuolization of their protoplasm. A patient with serous pericarditis and pleurisy who died with signs of extremely marked cardiac failure, but without very much exudate, showed **striking changes in the ganglions**, which looked as if they had been almost transformed into collections of leukocytes. The few ganglion-cells still discernible showed bloody and much vacuolated protoplasm, the nucleus having disappeared or having been displaced laterally. The vagus nerve showed no change. In a case of aneurysm of the ascending aorta there was degeneration of the ganglion-cells in the region near the origin of the aorta, but not elsewhere, and the nerve-fibers in the neighborhood of the aorta showed

¹ Boston M. and S. Jour., Jan. 14, 1904.

² Rivista crit. di clin. med., 1903, Nos. 39 and 40.

the picture of interstitial neuritis. In a case of hypertrophy of the heart following mitral insufficiency the ganglions showed only slight changes. In a case of angina pectoris occurring in a patient with lead-poisoning an examination of the myocardium and of the cardiac plexus was made. The myocardium showed a moderate increase in connective tissue and slight brown atrophy, without any other noteworthy changes. The cardiac plexus, however, showed **very pronounced degeneration of the nerve-fibers**. The bloodvessels showed no particular changes. The author thinks that the lead-poisoning produced a neuritis of the cardiac plexus, and that this was the primary cause of the angina pectoris. He also thinks that he has clearly demonstrated that changes in the nerve-elements of the myocardium without marked alteration in the muscle-fibers **may produce the clinical symptoms of so-called myocarditis**.

L. Weber¹ discusses the **syphilitic affections of the heart and of the aorta**, and states his belief that such conditions are much more common than is ordinarily thought. In the diagnosis it is almost impossible to reach a definite conclusion, unless syphilitic stigmata are present; but if signs of myocarditis are present in persons under 50 years of age, they should arouse a suspicion of syphilis. In the absence of any other satisfactory etiology, the author believes that syphilitic treatment should be tried in such cases; it may fail to cure, but often has remarkably satisfactory results, even when the symptoms and the physical signs are quite marked. He thinks that one should not rely upon iodids, but should also use mercury. He describes 4 cases that he considers to have been examples of the condition discussed.

I. Adler² agrees in considering that cardiac syphilis is very common. He particularly refers to one form not usually recognized, which he believes he has demonstrated to be a relatively common condition. This is a **primary interstitial myocarditis**, associated with clearly defined panarteritis. It is seen, he thinks, even in the early stages of syphilis. Attacks of angina pectoris in persons between the ages of 20 and 40, unless other definite cause for them can be found, are likely to be due to syphilis. Adler mentions such a case in a man of 28, cured by antisyphilitic treatment. He believes that it is much more commonly possible to make a diagnosis of cardiac syphilis with considerable certainty than is at all generally recognized, although often the diagnosis is one purely of probability.

TREATMENT OF CARDIAC DISEASE.

R. H. Babcock³ describes a number of cases of cardiac disease in relation to the **influence of high altitude**, particularly noting the varying effects of high altitude upon persons with such disease. He is in doubt as to the reason for the difference in these effects, and suggests that they may be due to the **differences in pulse-tension**; and that those that

¹ Med. Rec., Aug. 9, 1903.

² Med. Rec., Feb. 20, 1904.

³ N. Y. Med. Jour., Aug. 8, 1903.

experience discomfort at a high altitude are patients whose pulse-tension is low. He believes, however, that those with heart-disease can usually visit high regions or journey through such regions without producing symptoms, if they remain inactive until accustomed to the high altitude. Persons with normal hearts are really likely to have more symptoms than are those with weak hearts, because normal persons overtax themselves and set up a condition of cardiac overstrain.

K. Hasebroek¹ contributes an extensive discussion of the treatment of disturbances of the circulation by **gymnastic exercises**. He first states his belief that it has been demonstrated that the peripheral vessels have an active diastolic-systolic action, which is extremely important in carrying on the circulation. The brilliant effects that are sometimes obtained through gymnastics are, he thinks, chiefly seen in the cases in which this "**peripheral circulation**" is disturbed and in which the heart is normal. If the heart-muscle is not normal, improvement, he thinks, can be obtained only when the gymnastics favorably influence the peripheral circulation through functionally training the peripheral vessels, and through increasing the vitality of the peripheral tissues. If both the heart and the peripheral circulation are disturbed, gymnastics usually do damage; or, at least, do no good. The author thinks that the idea that gymnastics may directly influence a weak heart-muscle favorably is erroneous. He believes gymnastics to be a very important prophylactic measure in the early stages of chronic circulatory disturbance and in compensated valvular disturbance.

T. Schott² presents some observations on the **hemoglobin in cardiac cases** that had been subjected to baths, showing that **treatment with baths** and gymnastics causes, in many instances, improvement in the hemoglobin. Sometimes, however, the hemoglobin diminishes.

W. Krebs³ has made a study of the **influence of local cold** upon the cardiac action, and has decided that in cases of cardiac insufficiency due to nervous causes or to organic disease cold often works well, improving the strength of the pulse and the height of the blood-pressure, and causing the pulse to become slow. A great deal of this influence is due to the rest required for the application of this apparatus. Local hydrotherapeutic measures cannot take the place of digitalis.

W. Bruner,⁴ in discussing the use of **venesection**, particularly refers to the valuable effects obtained from it in cases of advanced heart-disease and emphysema of the lungs. He considers it important to use this measure when cardiac stimulants and diuretics have failed in their action. [We regularly use this measure, and very often with much satisfaction in certain cases, particularly those with some cyanosis and other evidences of marked mechanical difficulty. In several cases of adherent pericardium we have seen brilliant results when other measures had been entirely ineffectual.]

¹ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 3 u. 4.

² Brit. Med. Jour., Mar. 5, 1904.

³ Berl. klin. Woch., Apr. 25 1904

⁴ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

F. Kraus¹ discusses the diet of cardiac cases in relation to hydremia and dropsy. **Reduction in the amount of fluid causes**, in many cases of disturbance in compensation, a tendency to the excretion of an increased amount of fluid. This effect, however, is inconstant. The author rarely insists upon a "thirst-cure." He usually begins with restricting the amount of fluid to 1500 cc., and never decreases the intake below 1000 or 800 cc. He uses regulation of the water-intake **chiefly as a preventive measure**. He finds that cardiac drugs often show a much more marked action when the water-content of the patient's organism has been regulated. With the measures mentioned, when carried out with care, he has never seen unfavorable results; and the patients do not complain of distressing thirst. They are much more likely to show a reduction of appetite, particularly for solid food; and to exhibit a marked decrease in body-weight. As a rule, Kraus, especially in the beginning, employs restriction of the fluids only for certain periods of time. He begins with 1500 cc., then decreases the amount to 1200 or 1000 for a few days, and afterward increases the amount to 1500 cc. He thus gets the patients **gradually accustomed to the reduction in the fluids**, so that they can regularly be entirely comfortable with 1000 cc. a day.

H. Strauss² discusses **regulation of the intake of fluid and of sodium chlorid** in disease of the heart and of the kidneys. The character of the urine in cardiac dropsies is a small total amount with a normal or increased relative amount (in percentage) of sodium chlorid; while in renal dropsies the amount of urine is less decreased, but there is a much more marked reduction—both relatively and absolutely—of sodium chlorid. When the total amount of excreted sodium chlorid is considered, however, one finds that in moderate forms of disturbance in cardiac compensation the percentage-amount of sodium chlorid may be normal, but that the total amount excreted is decidedly reduced; that is, that the conditions are actually similar to those in moderate forms of renal disturbance. After prolonged disturbance in cardiac compensation heart-tonics or diuretics—particularly digitalis—cause an increase in water-excretion, and often a much more marked sodium-chlorid excretion. When diuresis accomplishes the latter result, the effect upon the dropsy is likely to be particularly good. The author believes that in renal dropsy, if the amount of urine is about normal, a reduction in the intake of sodium chlorid is much more important than is a reduction in the intake of water. In disturbance of cardiac compensation, on the contrary, the water especially should be reduced. These patients, however, should also avoid an excess in sodium-chlorid intake; and in severe disturbance of compensation it is important to reduce decidedly the intake of chlorid—particularly if the excretion of chlorids is very low. In renal cases, if there are no signs of disturbance in the circulation, one should be very careful in attempting to reduce the intake of chlorids for any considerable period. [The previous observations of the French on this subject have been very interesting and suggestive.]

¹ Therap. d. Gegenw., July, 1903.

² Therap. d. Gegenw., Oct., 1903

Von Tabora¹ discusses the use of **barium chlorid** in treating circulatory disease. Its use dates back to over 100 years ago, but the preparation has fallen into disuse. Good results from its administration have recently been described, and this paper from Riegel's clinic discusses the results in 36 cases. Some of these were in normal persons, some in those with cachexia, and some in those with various kinds of cardiac disease and with acute febrile disease and renal change. The general conclusions formed from this study are that the indication for the use of barium chlorid is **chiefly in infectious diseases** in which the circulation is weakened by central vasomotor paralysis, rather than by primary weakness of the heart. The results in pneumonia are said to have been particularly good. The drug acts chiefly by increasing the blood-pressure through its **influence upon the vasomotors**. It does not have a satisfactory effect in profound primary cardiac weakness, digitalis being more useful in such cases. In the infectious diseases it is considered by the author to be important.

DISEASES OF THE ARTERIES.

O. Moritz² discusses **blood-pressure in normal persons and in those with disease of the heart**, referring to his own investigations. He concludes, in the first place, that **in normal persons work of moderate degree causes no change** in the blood-pressure. With moderately excessive work the blood-pressure rises, remains on a higher level, and then falls again with the cessation of the work. With decidedly exhausting labor the blood-pressure rises constantly until the cessation of the work, and then falls. There may be combinations of the last two forms. For instance, with moderate overwork of prolonged duration the pressure rises, stays on a high level for a time, and then rises constantly and sharply. The author believes that this rise in the blood-pressure in overwork is **due chiefly to psychic influences**; viz., that the more one is obliged to tax one's self, the more attention must be given to the work, and the more mental strain there is connected with it. Work that may be considered to be physiologic, though excessive, such as long marches performed by soldiers, does not cause a rise in the blood-pressure. As to cardiac cases, Moritz states that **in degeneration of the myocardium work causes an increase in the blood-pressure**; but that this tendency soon—often during the progress of the work—ceases. After the work has been discontinued the blood-pressure sinks to normal more slowly than is the case in healthy persons. If work causes only a slight increase in blood-pressure, there is a **severe functional disturbance of the heart power**. In valvular disease the conditions may be normal; but if there is a decided defect, they are like those seen in disease of the heart-muscle. The author has not been able to find any marked distinction between disease of the aortic and of the mitral valve, in relation to the effect of work upon the blood-pressure. In all cardiac cases **the blood-pressure**

¹ Deut. med. Woch., Sept. 24, 1903.

² Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 3 u. 4

may sink below normal after work has ceased. This indicates cardiac exhaustion. A disturbance in compensation is not always accompanied with a depression in the blood-pressure during exercise.

Karrenstein¹ discusses the effect of body-work upon blood-pressure. He carried out his studies with a series of soldiers, using the Gärtner tonometer. His results indicate, he believes, that body-work does not increase blood-pressure in a normal subject. The blood-pressure usually decreased after prolonged bodily exercise; or, at most, remained at the same level.

W. H. Russell² discusses **arterial sclerosis and hypertonus** in their relation to diet and the digestive system. He emphatically insists upon the necessity for distinguishing between sclerosis and hypertonus, this being done chiefly through observing the sphygmograms determining the blood-pressure, etc. [though it is not made entirely clear how one can definitely distinguish clinically between persistent hypertonus and arteriosclerosis]. He especially refers to the toxic conditions that produce hypertonus, insisting particularly upon disturbance of the gastrointestinal tract as being the chief cause. The principal treatment, therefore, is in the line of diet. He recommends reducing the proteid element and increasing the carbohydrate, always exercising especial care not to weaken too far an already overtaxed heart.

Arteriosclerosis.—K. Sawada³ has made a study of the **blood-pressure in 206 cases of arteriosclerosis**, using the improved v. Recklinghausen instrument. He considers any cases that show more than 130 mm. pressure to be excessive, those between 120 and 129 to be on the border, and all those below 120 to be normal. Ninety-eight cases showed normal conditions of the heart and kidneys, **and 83 of these showed normal blood-pressure**; 10 were on the border and 5 showed a pressure above 130. Only one showed a very high pressure (*i. e.*, 176 mm.), and in this case there was possibly a change in the kidneys. Of the 42 cases of early arteriosclerosis in this group, 3 were on the border and 2 showed pressure above 130. Of the 42 cases that were of moderate grade, 5 were on the border and 2 were increased. Of the 14 advanced cases, 2 were on the border and 1 was increased. Of the 206 total cases, 24 showed an accentuated second aortic sound; 13 of these had normal pressure, 1 was on the border, and 10 showed pressure chiefly between 140 and 164. The conditions were much more complicated in those that had cardiac or renal diseases, and were more difficult to judge. There were 8 patients who had marked arteriosclerosis in early life, ranging from 14 to 26 years of age, and belonging to the special group emphasized by Fraentzel and Romberg. In only 3 of these cases was the blood-pressure above 120; in 1 of these it reached 131. One patient, a girl of 14 years, showed only 80 mm. pressure. As a general conclusion, Sawada states that of the total number of cases **only 12.3 % showed increased pressure**, and this was moderate. Two-thirds of the patients

¹ Zeit. f. klin. Med., Bd. 1, Hefte 3 u. 4.

² Brit. Med. Jour., June 4, 1904.

³ Deut. med. Woch., Mar. 17, 1903.

who had increased pressure showed accentuation of the second aortic sound, and in these cases the pressure was usually above 140 mm. When interstitial nephritis was evidently present, the blood-pressure was, on the average, decidedly higher than when arteriosclerosis was present without any kidney-lesion; and he believes that a **pressure above 160 mm. is sufficient to arouse a very strong suspicion of the presence of interstitial disease of the kidneys**, even though albuminuria be absent.

H. B. Anderson,¹ in discussing the etiology and pathology of arteriosclerosis, refers to a **case in a boy of 11**. The case came to autopsy, and advanced and widespread arteriosclerosis, with chronic interstitial nephritis, was found. There was no history of syphilis. The boy had had scarlet fever. Anderson publishes a series of observations that he has made in persons applying for large policies in life-insurance companies. They were supposed to be men in the best of health, but they had been subjected to strain, chiefly financial, and were most of them inclined to overeating, to taking insufficient amounts of exercise, and often to the use of alcohol. It is an interesting fact that in practically all the cases abnormalities of the urine were found—a trace of albumin, a few casts, or some cylindroids. In many of the cases these were found in combination. All but 2 out of 30 showed a trace of albumin. Anderson believes that these signs indicate a systemic condition that, if persisted in over a series of years, will eventuate in arteriosclerosis. He especially emphasizes the importance of **general nutritional disturbances** in the symptomatology of arteriosclerosis. These disturbances of nutrition are sometimes more noteworthy in some organs, and sometimes in others; but an endless variety is possible. Anderson also refers to the frequency of the occurrence of **edema in arteriosclerosis**. This appears either spontaneously or as the result of trifling exciting causes. An otherwise unexplained edema is, therefore, very suggestive, as is hemorrhage that is not explained by other means.

Simnitzky² insists that arteriosclerosis **frequently occurs in young persons**. In over 27 % of all persons under 25 years of age examined by him he found arteriosclerotic changes in the aorta. **Infectious diseases are the chief cause** of this. Simnitzky believes that slight lesions may heal entirely. He especially insists that arteriosclerosis is not purely a disease of senility, but that it is a result of the various damaging factors that occur throughout life.

W. S. Thayer³ has made a **study of the heart and bloodvessels** in 183 persons who, within 13 years previously, had been under observation at the Johns Hopkins Hospital with **typhoid fever**. He finds that the average blood-pressure in these old typhoid-patients in all decades is appreciably higher than in control observations made with healthy persons. In many instances the old typhoids showed a blood-pressure above the normal. They also showed three times as great a proportion of palpability of the radial artery as did healthy persons who had never had typhoid fever. The old typhoids also showed, on the average, an

¹ Amer. Med., Mar. 12, 1904.

² Zeit. f. Heilk., Bd. xxiv.

³ Am. Jour. Med. Sci., Mar., 1904

increase in the size of the heart and a relative frequency of cardiac murmurs. In 8 cases signs of mitral insufficiency had developed since discharge from the hospital; in one case there was possible mitral stenosis; in one, aortic insufficiency; in one, a marked general arteriosclerosis with arterial hypertension; and one had shown an aortic diastolic murmur for 4 months after discharge, but this had disappeared. On the average, the patients who had shown rapidity or irregularity of the pulse during the course of typhoid fever showed later on blood-pressure readings above the average for the old typhoids, though showing no other marked differences from the average; but those cases in which a systolic murmur had been noted during the attack showed later an increase in the blood-pressure and in the size of the heart, as compared with the average of these cases when first admitted to the hospital, and also as compared with the general average in the old typhoid cases. Nearly one-fourth of the cases in which, at the time of the attack, systolic murmurs were heard at the apex showed, on later examination, signs of organic heart-disease. In fact, the cases that during the attack had shown murmurs furnished the majority of all cases of subsequent organic cardiac lesion. On the whole, Thayer believes that his observations support the views of those that think that **typhoid fever is an active element in producing cardiac hypertrophy and dilation and arteriosclerosis.**

A. Stengel¹ discusses the **early diagnosis of arteriosclerosis.** He particularly insists upon the **importance of overfeeding** in the production of arteriosclerosis, and also of heredity. He emphasizes the great importance of recognizing the very earliest symptoms, because at this period the disease is subject to a considerable degree of retardation or to actual arrest. In developing the symptomatology of very early arteriosclerosis he believes that pathologic studies will be of very little value, it being necessary to depend almost entirely upon painstaking clinical observation. He has invariably found the **blood-pressure high in the early stages.** The first heart-sound becomes lengthened and heavy in the beginning, weakening later. The sphygmogram, even in the beginning, shows a **sharp percussion-wave**, due, Stengel believes, to the prolonged expressive action of the left ventricle. He notes, however, that there are many conditions, both organic and functional, in which the blood-pressure is persistently high and in which arteriosclerosis is not the cause of the high pressure. In the symptomatology he notes a **reduction in the general energy and vitality**, and the frequency with which the symptoms follow **nervous shock or strain.** He believes that neurasthenia is much more frequently cardiovascular in origin than it is usually considered to be. The patient shows a loss of color, and later has a **false appearance of anemia**, although the blood-count is not that of anemia. In the early stages the patients frequently show abnormal sweating, and Stengel particularly notes disturbance of the equilibrium of renal action, there being periods of polyuria followed by periods of reduced excretion, and **marked variations in the specific gravity of the urine.** He thinks that the **renal permeability** is less uniform in the early stages than it is under normal conditions.

¹ Amer. Med., Jan. 2, 1904.

A. Landau¹ reports some interesting observations concerning **intermittent renal insufficiency in arteriosclerosis**, making a study of the blood and the urine; and reaching the conclusion that there are attacks of insufficient functionation of the kidney in arteriosclerosis, which are **shown by cryoscopic examination**, but in which ordinary clinical observation shows nothing. The condition is apparently somewhat analogous to attacks of angina pectoris and of intermittent claudication. Landau does not believe that intermittent insufficiency of the kidneys is due to cardiac insufficiency, but that it is idiopathic and is an evidence of the involvement of the kidneys in the arteriosclerotic process. It is a question in his mind whether it is an entirely separate nosologic unit, or is merely either a warning of the probable appearance of change in the kidney or an evidence of the change that is already present.

Aortitis.—T. C. Allbutt,² in discussing diseases of the ascending aorta, refers particularly to aortitis, and insists upon the **greater importance of aortitis than that commonly ascribed to it**. He mentions one case in which the signs of aortitis came on in a young housemaid directly after lifting a heavy weight. She ultimately became crippled and suffered a great deal with anginoid pains. Allbutt believes that aortitis may be due to actual infection of the aorta; but that, on account of the swiftness of the current at this point, it is probably **easier for toxins to act than for bacteria** to produce local infection. Chronic aortitis, also, should receive much more attention in diagnosis than it does. Allbutt refers to the **very small aneurysms** that not infrequently form at the root of the aorta. These, he thinks, might be diagnosed by means of the x-rays. They sometimes give rise to the signs of aortic disease and to angina pectoris. He finds that aortic disease may occur in lead-poisoning without renal disease. In syphilis there may be a distinct mesarteritis. The **general symptoms of chronic aortitis** are varied; but headache, dyspnea, and vertigo are among the early manifestations. The dyspnea is distinct from that due to heart- or lung-affections, and comes independently of the pain, resembling spasmodic asthma. It does not show perfect relief by expectoration nor are Curschmann's spirals present. **Pressure-symptoms** are quite common in mere dilation of the aorta without aneurysm, and they are usually present in the late stages of chronic aortitis. Attacks of acute pulmonary edema not infrequently occur, but Allbutt has never seen them unless general arteriosclerosis has been present. Emphysema, however, is common. He insists that **angina pectoris** is often due to atheroma of the aorta, without disease of the coronary arteries. He finds that anginoid attacks, so similar to angina as to deserve the same name, are not uncommon after acute infection. He believes that when dyspnea occurs with angina pectoris, the heart also is diseased or is gravely oppressed from the effects of the pain. The attacks of angina rarely cause death unless the heart is diseased. Angina may come and go in patients with chronic aortitis, in correspondence with variations in the condition of the aortic disease. The **physical signs of**

¹ Berl. klin. Woch., Dec. 21, 1903.

² Lancet, July 18, 1903.

chronic aortitis are the evidences of general physical deterioration, or at times the appearance of plethora; prominence, and perhaps pulsation, of the veins of the neck, with excessive arterial pulsation; a thrill over the upper chest; and perhaps a palpable aortic arch in the suprasternal notch. There may be differences in the strength of the carotid beats, and the innominate may be visible or palpable, even above the collar-bone. There may be a distinct difference between the diastolic volumes of pairs of arteries (as, for instance, the two radials), or a pair of arteries may be weak, as compared with the general standard of pressure in the case. **Mobility of the apex of the heart**, resulting from elongation of the aorta, is of some importance. There is not necessarily any cardiac hypertrophy. Radioscopy may show enlargement. Percussion is the most important method of observation, revealing a **dull area at the base of the heart**, to the right—somewhat like the “crest of a fireman’s helmet.” Auscultatory signs are equivocal. One of the most important, if present, is the so-called *bruit de tabourka*, which is a **peculiar clang associated with the second aortic sound**. This indicates a state of the valves rather than of the aorta, but a valvular condition that is directly due to extension of the aortic disease. Allbutt thinks that relative aortic insufficiency is a rare condition. He refers to the chafing sound of a dry basic pericarditis, not uncommon in aortic disease. This sometimes originates within the aorta, but sometimes invades the aorta from the outside. It is particularly important to recognize angina due to this pericardial disease about the aorta, as it is much more subject to treatment than is the ordinary form.

Tortuosity of the Aorta.—J. Sailer and G. E. Pfahler¹ discuss tortuosity of the aorta, having been led to make a study of this condition through the frequent discovery of some of the **lesser signs of aneurysm** by combined clinical examination and fluoroscopy. The chief of these signs were inequality of the radial pulse, suprasternal pulsation, tracheal tug, accentuation of the second aortic sound, and a brassy cough. Sometimes, also, there were dyspnea, anginoid attacks, and localized pain. In a number of cases the authors observed with the fluoroscope **an expansion of the shadow of the aorta** at the level of the fifth or the sixth dorsal vertebra, extending $1\frac{1}{2}$ to 2 inches to the left. Some of these cases were examined postmortem, and in the majority of instances no dilation of the aorta was present, and sections through the wall of the aorta at this point did not indicate that there was any diminution in the muscular layer. It was, however, determined in one instance in which a careful examination could be carried out that the **aorta made a bend to the left** at this point in such a way as to remind one of the tortuosity observed in the peripheral vessels in cases of atheroma. A description of 18 cases is given. Inequality of the pulse was present in 10; inequality of the pupils in 3, in one of which it was probably due to some nervous condition; suprasternal pulsation in 12; tracheal tug in 11; a systolic thrill in 9; a systolic murmur in 11; dyspnea in 12; and precordial pain in 7. Disease of the heart was present in many of the cases. The symp-

¹ Am. Jour. Med. Sci., Oct., 1903.

tomatology of tortuosity of the aorta is difficult to give; but many of the signs suggestive of aneurysm are not uncommon, and these may be associated with signs—such as murmur, thrill, suprasternal pulsation, etc.—that are found in aneurysm of the arch. The authors think that it is justifiable to suspect tortuosity in cases that exhibit inequality of the radial pulse, slight tracheal tug, and dyspnea, if the symptoms remain stationary for a considerable length of time; and if the fluoroscope shows a projection to the left of the descending portion of the arch of the aorta, this projection showing expansile pulsation.

Aortic Aneurysm.—H. Arnsperger,¹ in a discussion of the etiology and pathogenesis of aortic aneurysm, gives a general review of the literature of the subject, and describes a series of 52 personal cases. He reaches the conclusion that **syphilis is present in the history in a great proportion** of these cases, while other etiologic factors are present in but a relatively small number. He believes that syphilis is the most important etiologic factor, and that trauma has relatively little importance. In many cases aortic aneurysm, in his belief, arises from inflammatory changes in the aorta, these being usually due to syphilis. [Arnsperger appears to minimize altogether too decidedly the importance of other factors.]

H. Quincke² describes 2 new observations of **undoubted syphilitic aneurysm** of the aorta, in addition to the 6 that he has previously reported. In one of these 2 cases the use of iodids caused very marked subjective improvement, with a reduction in the physical signs and in the x-ray shadow. The other case ended fatally; the use of iodids, however, had apparently produced decided shrinkage in the aneurysmal sac. In a case of syphilitic disease of the arteries associated with cerebral syphilis the left brachial and radial pulses were, in the beginning, much smaller than those in the right; and there was a murmur over the sternum and the left subclavian. Under treatment with iodids the pulses in the two sides became equal and the murmur disappeared.

S. Jellinek³ demonstrated to the Vienna Medical Society a case of aneurysm of the aorta that showed **decided peculiarities**, among which was a **marked mobility of the sac**, which produced a decided increase in the dulness when the patient leaned forward; and also a **paralysis of the recurrent nerve, which was inconstant**.

F. H. Edgeworth⁴ reports 3 cases of aneurysm of the aorta that arose from the second portion of the arch. He used the **gelatin-treatment** without determining that any noteworthy results were obtained.

G. Rankin⁵ reports 4 cases of aneurysm of the aorta in which he used gelatin-injections. The patients were all improved—in some instances, markedly so. Rankin thinks that in 3 cases a decrease in the size of the aneurysm could be determined by physical examination. In some of the cases he was able to secure subsequent histories, and the patients were found to be still doing well.

¹ Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 5 u. 6.

² Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 1 u. 2.

³ Zent. f. inn. Med., Jan. 23, 1904, p. 107.

⁴ Bristol Med.-Chir. Jour., Mar., 1904.

⁵ Lancet, July 11, 1903.

Lazarus¹ demonstrated to the Berlin Medical Society an aortic aneurysm from a patient that had clinically shown nothing but dyspnea, with a peculiar whistling cough. Treatment with **iodipin-injections** at first caused improvement, and the patient left the hospital; but soon came back in wretched condition and died. Postmortem showed a large aneurysm.

W. R. Kingdon² discusses the treatment of thoracic aneurysm with **large doses of potassium iodid**, reporting a case in which there was a mass projecting externally on the chest; and even at times bleeding from this mass. Large doses of potassium iodid were given, 80 grains 3 times a day being the highest point reached; and this was continued for a number of weeks. The patient had only very slight signs of iodism, and ultimately recovered almost completely. Two other cases [in which the diagnosis seems a little questionable] in which the same treatment was used are reported.

Arterial Stenosis.—S. Jellinek³ exhibited to the Vienna Medical Society a patient with stenosis of the **left pulmonary artery**, this condition having been diagnosed because of the presence of left-sided indurated pleurisy, retraction of the mediastinal tissues toward the left, and a murmur localized over the left pulmonary artery and transmitted toward the left.

Embolism and Thrombosis.—K. Oswald⁴ discusses embolism and thrombosis of the **mesenteric vessels**, particularly referring to the fact that the most characteristic symptom is hemorrhage from the intestines associated with colicky pains, a fall in temperature, and subsequent distention of the abdomen, with free exudation into the abdominal cavity and signs of peritonitis. He emphasizes the fact that **in about two-thirds of the cases hemorrhages seem to be absent**. This makes the **diagnosis extremely obscure or impossible**. Oswald reports the case of a paretic 36 years old who had had febrile intestinal catarrh. While improving, he was suddenly taken with violent collapse and vomiting, and death occurred after 4 hours. This condition it was impossible to diagnose, but it was found at postmortem to have been due to embolism of the superior mesenteric artery and its branches, and to thrombosis of the superior mesenteric vein and its branches, with hemorrhagic infarct of the small intestine. This combination of **embolism of the superior mesenteric with thrombosis of the entire territory of the great mesenteric veins** Oswald has found reported in but 3 other instances. The thrombosis had probably been due to bacterial invasion of the veins resulting from the embolism. He also reports the case of a man of 49, who had had febrile enteritis, and some time afterward had the signs of intestinal obstruction, uninfluenced by atropin. Death occurred on the third day, the cause in this instance being found to be embolism of several branches of the superior mesenteric. The more prolonged course in this case permitted of the development of the character-

¹ Zent. f. inn. Med., Jan. 6, 1904, p. 31.

² Lancet, Aug. 22, 1903.

³ Zent. f. inn. Med., Jan. 23, 1904, p. 107.

⁴ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

istic picture of ileus. As to treatment, Oswald thinks that one should wait until there is evident intestinal obstruction before operating. If this is present in the beginning, operation should be undertaken at once.

DISEASES OF THE VEINS.

Osler¹ discusses **obliteration of the superior vena cava**, reporting 2 cases, in the first of which the preceding history showed hard work, exposure, alcoholism, and an almost immediately preceding debauch. This man had dyspnea, swelling of the neck and face, and gradual distention of the superficial thoracic and epigastric veins. The patient improved and was discharged, but was readmitted. Tuberculosis was finally determined to be present, and he died of tuberculous meningitis. The postmortem showed, besides tuberculosis of the meninges and spinal canals, a **fibrous-tissue growth in the mediastinum**, causing involvement and occlusion of the superior vena cava and the innominate vein. The second patient had Hodgkin's disease, with **compression of the superior vena cava**, followed by the development of an extensive collateral circulation and the formation of phleboliths. He showed a remarkably chronic course, having had the symptoms for about 3½ years. A summary of the cases in literature, 29 in number, is given. The main causes of occlusion are phlebitis, tuberculosis, mediastinitis, aneurysm, syphilis, periaortitis, carcinoma, and fibroma.

C. J. Aldrich² refers to 9 cases, which he has found in literature, of **thrombosis of the jugular veins**; and reports his own case, in which there was thrombosis of the left internal jugular, extending through the subclavian and axillary into the basilic vein. This was followed, 2 weeks later, by a thrombus on the right side, extending into the veins of the arm. Death occurred from an extension of the right-sided thrombosis into the cerebral sinuses. There was no autopsy.

E. Neisser³ reports an extremely remarkable case of what he terms "**wandering phlebitis**." The patient, who was 46 years old and, it was subsequently determined, had a probable **luetie history**, at first presented 2 swellings on the forearm, which were spindle-shaped and painful and about an inch long. Their nature was in doubt, but operation was undertaken, and it was shown that they were localized swellings of the vein. The intima proved to be normal, except for injection, while the media and the adventitia were both decidedly thickened. The man soon afterward presented several other nodules, appearing one after the other. Seven, in all, developed. They gradually disappeared, and the symptoms vanished after prolonged treatment with potassium iodid and mercury. Microscopic examination of the tissue removed showed it to be an inflammatory process of the wall of the vein and of the perivascular tissue, with vascularization, immigration, proliferation, occasional small hemorrhages, and the formation of granulation tissue. This appeared to arise from the vasa vasorum of the adventitia. The intima was in part

¹ Johns Hopkins Hosp. Bull., July, 1903.

² N. Y. Med. Jour., Mar. 5, 1904.

³ Deut. med. Woch., Sept. 10, 1903.

entirely normal, and in part it showed the changes already mentioned. The endothelium was entirely normal, and there was no sign of thrombosis. It was evidently a primary disease of the vessel-wall. The most remarkable part of the case was that Neisser believes that it could be definitely determined while the patient was under observation that **these nodules moved from day to day**, their progress being proximal, and their rate of movement being about 1 cm. per day. Individual nodules were followed over a distance of as much as 6 cm. The appearance of the nodule that was removed indicated that the injected end of the nodule was that in which the progress was taking place. The patient stated positively that one nodule had wandered from the face, over the neck, and down the upper arm to the elbow, where it had divided, one portion going down the outer, and the other down the inner, side of the forearm. Another nodule, he said, had wandered as far as 10 cm. This statement was subject to doubt, but a movement of several centimeters was definitely observed, and is, Neisser says, not subject to doubt. This was the most striking characteristic of the case, and no similar observation has been found in literature.

DISEASES OF THE RESPIRATORY SYSTEM.

GENERAL CONSIDERATIONS.

M. Mignon¹ recommends the use of a **diapason** in the auscultatory exploration of the organs in general, and particularly insists upon its importance in making an examination of the bones and of the chest. In connection with the other methods of observation, he believes, this will yield very useful results.

D. N. Carpenter² contributes a description of a **persistent epidemic of "catarrh"** that occurred on board the U. S. S. "Illinois." The nature of this epidemic could not be clearly determined. It was undoubtedly contagious; the usual seat of trouble was the respiratory tract; leukocytosis was present; and in some instances there were obtained positive blood-cultures, in which a coccus similar to a **degenerated culture of staphylococcus** was found. In 6 cases there were pyemic symptoms and arthralgia. Many refractive bodies were found in the blood, and were probably blood-plates. The influenza bacillus was absent. Swabs from the nose and throat showed the ordinary bacteria to be present; but these were found in large numbers, and a medium-sized diplococcus predominated. Carpenter discusses the hygiene of the quarters of the men on board battleships, in particular, and makes suggestions designed to improve the conditions.

¹ Bull. de l'Acad. de Méd., Dec. 22, 1903.

² Jour. Assoc. of Military Surgeons, Jan., 1904.

ASTHMA AND EMPHYSEMA.

E. E. Laslett¹ discusses the **nature of Curschmann's spirals**, stating his belief that they are of similar origin to the casts of bronchitis. He describes a case in which there were attacks of asthmatic dyspnea and the patient expectorated a large number of Curschmann's spirals. There were also casts of the smaller bronchi. Laslett notes that fibrinous casts frequently show spiral terminations, which are practically identical in structure with true Curschmann's spirals. In his case he found that the spirals owed their peculiar structure largely to the arrangement of the great number of cells present, and that some of the spirals terminated in two equal branches, of smaller diameter than the parent stem. He therefore finds it difficult to believe that these structures are formed by the spiral movement of exudate in the bronchial tubes. He inclines to the view that the small bronchi have themselves a **spiral, corkscrew-like course**, and that this lends the spiral shape to these bodies.

C. Campbell² reports that for more than 9 years he has regularly been treating asthma with **direct intratracheal injections**, and has had most satisfactory results. He chiefly uses menthol, glycerin, and gelatin. He says that he would have no hesitation in injecting at one sitting 30 grains of menthol with 2 ounces of glycerin. The object of this treatment is to control the spasm of the smaller bronchi and to relieve the anhydrous condition of the mucous lining. Campbell contributes a series of interesting case-reports, which show strikingly favorable results. He states that he has had no bad consequences.

T. F. Reilly³ has had excellent results from the use of a **suprarenal spray** in controlling attacks of asthma in cases that were not hay-asthma.

J. G. M. Bullowa and D. M. Kaplan⁴ report a series of cases of asthma treated with **hypodermic injections of adrenalin chlorid**, in doses of from 3 to 6 minims, of the 1:1000 solution. The results have been generally excellent. They believe it is a valuable means of treating this affection, and that the results also favor the angioparetic theory of the origin of the disease.

N. Golubow⁵ discusses the **etiology of emphysema** of the lungs, and refers particularly to dilation of the aorta and to abnormalities in the ribs. He describes a case in which, he believes, the clinical course indicated that **aortic dilation** had produced emphysema; and he particularly refers to cases that he has observed and that have appeared in literature in which aortic dilation caused severe attacks of spasmodic cough, undoubtedly through reflex irritation. He thinks that it is equally possible for aortic dilation to cause emphysema as the result of such violent cough or **without dependence upon cough**. He believes that when spasmodic cough of obscure causation, usually followed by secondary signs of catarrh of the bronchial tubes, appears, and when signs of pulmonary emphysema occur

¹ Lancet, Nov. 7, 1903.

² Liverpool Med.-Chir. Jour., Jan., 1904.

³ Jour. Am. Med. Assoc., June 4, 1904.

⁴ Med. News, Oct. 24, 1903.

⁵ Deut. med. Woch., Oct. 1 and 8, 1903.

also, one should think of the possibility of aortic dilation. A moderate dilation of the atheromatous aorta is of frequent occurrence, and does not need to reach the grade of an actual saccular aneurysm. The other factor to which Golubow refers is an **anomaly of the costal cartilages**, resulting in all the cartilages below the third or fourth becoming united before they reach the sternum, and forming at the lower end of the sternum one mass of cartilage. The presence of such a condition may be determined by careful palpation. In cases in which the anomaly was found Golubow has observed emphysema to develop without any other recognizable cause.

BRONCHIECTASIS.

D. B. King¹ discusses the value of the **Röntgen rays in bronchiectasis**, and states that in some cases the *x*-rays have failed to show the presence of bronchiectases, even though physical examination by other means and also postmortem examination have revealed them. Saccular and gangrenous cavities are also often **repeatedly overlooked by the Röntgen rays** when other clinical methods show their presence. For detecting foreign bodies in the lung the *x*-rays are undoubtedly of value; but one should be guarded, because sometimes the appearances of foreign body seen may be due to other conditions, such as calcareous glands. In early cases of bronchiectasis one should examine the chest with the *x*-rays on more than one occasion. If a foreign body is the cause of the condition, the *x*-rays will usually show its presence, when ordinary clinical methods would be insufficient. In most cases the *x*-rays fail to confirm the results obtained with other methods, and also fail to give any further information. King thinks, also, that the *x*-rays are of little or no use in treating bronchiectasis.

A. K. Siewert² reports a case of bronchiectasis in a patient 21 years old with transposition of the viscera. Apparently the bronchiectasis was **congenital in this case**, so far as the history could be relied upon. A few other cases of congenital bronchiectasis are referred to.

PLEURISY.

J. B. Herrick³ discusses **abdominal pain in pleurisy and pneumonia**, and refers to its especial frequency in children. He also notes that abdominal and thoracic disease may occur together, but that pneumonia or pleurisy is not uncommon after appendicitis, both being probably the result of the same infection. He mentions one case of typhoid fever in which sudden abdominal pain due to pleurisy caused a strong suspicion of perforation, but in which careful observation led to the proper diagnosis.

R. v. Stenitzer,⁴ in discussing the **diagnosis of diaphragmatic**

¹ Practitioner, Feb., 1904.

² Berl. klin. Woch., Feb. 8, 1904.

³ Jour. Am. Med. Assoc., Aug. 20, 1903.

⁴ Wien. klin. Woch., 1903, p. 475.

pleurisy, refers to the peculiarly intense pain situated in the lower part of the thorax and radiating thence; the sensitiveness to pressure over the phrenic nerve in the neck; the high position of the diaphragm on one side; the lessening of the respiratory movement in the lower part of the thorax; the absence of Litten's phenomenon, and the presence of Schmidt's, which is a reflex contraction of the upper part of the abdominal muscles during inspiration.

G. Sagianz,¹ in a preliminary communication, discusses the **behavior of the leukocytes in pleurisy**, basing his remarks upon a study of 30 cases, of which 21 were serofibrinous, 5 of these being certainly tuberculous; and of which the other 9 were instances of empyema. His examinations were ordinarily made once a day, and were carried out from the time that the presence of an exudate was determined until the exudate had been removed through general treatment or by means of operation. He finds that in the idiopathic or rheumatoid form of pleurisy there is, neither at the beginning nor after the production of a large exudate, any leukocytosis; or, if one be present, it is temporary and slight. In serofibrinous pleurisy there is no relation between the number of leukocytes and the pulse and temperature or the size of the exudate. The author gives descriptions of cases of the different forms of pleurisy, and concludes that **serous pleurisy of nontuberculous origin**, even when the exudate is large in amount and there is decided fever, has **no influence upon the number of leukocytes**. Tuberculous serous pleurisy causes a slight increase in the number of leukocytes (15,000 to 20,000). This is, however, chiefly dependent upon the stage of the primary disease (pulmonary phthisis). Empyema causes a decided increase in the number of leukocytes. Their number decreases with the emptying of the pus, and goes parallel with the degree of retention of pus. Sagianz states that animal-experiments carried out by him have confirmed these clinical observations. [Some of these observations are not in agreement with those of many other investigators.]

W. Barjeon and Cade² report 5 cases in which large numbers of eosinophile corpuscles were present in pleural effusions. They have examined 130 cases in all. They limit the term **pleural eosinophilia** to effusions in which more than 10 % of eosinophiles are found. They refer to the observations of others, and state that they do not believe that this condition is due solely to tuberculosis, but that it is also **due to various other diseases**. There is a relative eosinophilia of pleural effusions, in which the eosinophiles do not exceed about 5 %. In this class tuberculosis is usually the cause. In the class that the authors term true eosinophilia, in which the eosinophiles have varied from 10 % to 74 %, the condition is of somewhat greater clinical importance, as it occurs in **cases that are usually acute and have no tendency to recur**, that show a mixed formula in the cell-count, and the blood from which does not produce tuberculosis when injected into guineapigs. Barjeon and Cade think that in this latter class of cases the prognosis is good.

¹ Zent. f. inn. Med., Jan. 9, 1904.

² Arch. gén. de Méd., July, 1903.

K. Connell¹ describes a **cheap, convenient, and powerful aspirator** used in the New York Hospital. He states that it has, in this and in other hospitals in the same city, entirely superseded the more expensive forms of apparatus. It costs, in all, a little more than half a dollar. The aspirator consists of a strong glass bottle with a mouth about 1 inch in diameter. The bottle holds about 5 pints. It has a rubber stopper, through which passes a glass tube, to which is attached a piece of firm rubber-tubing. The latter is attached to an aspirating needle. In using the apparatus 3 drams of 95 % alcohol is poured into the bottle, which is manipulated so that the alcohol may cover its entire inner surface, the excess being poured off. The bottle is then placed upright and the alcohol is ignited. As the flame touches the bottom of the bottle the cork is inserted. The rubber-tubing has meanwhile been clamped with a pair of hemostatic forceps. The vacuum produced by this procedure is said to be quite sufficient to withdraw as much fluid as is safe. No accidents have ever occurred through the use of this aspirator.

VARIOUS AFFECTIONS OF THE LUNGS.

R. Bevan² reports an interesting case of **pneumothorax** that occurred in an **apparently healthy man** as the result of allowing a heavy pile of books to fall upon his chest, preparatory to carrying them some distance. He developed extensive pneumothorax, which was completely cured after 8½ weeks. The symptoms did not appear for several hours after the probable cause had acted. Bevan believes that the condition may have been produced by nipping or forcibly compressing the edge of the lung, and thus rupturing an air-vesicle. There was no reason to suspect tuberculosis.

H. M. Hewlett³ reports 4 cases of **acute suffocative pulmonary edema**, the patients having repeated attacks of this condition. All the cases occurred in women at or past the prime of life, and all the patients **showed evidences of chronic cardiovascular and renal disease**. The most striking point was the great increase in systolic blood-pressure. Alcohol was probably an important etiologic factor. The attacks usually occurred at night, frequently after little extra exertion or fatigue, although this was not always the case. They came on with the utmost suddenness, and usually disappeared with almost equal rapidity, when recovery occurred, the chief feature of the attack being violent suffocative anxiety and the appearance of imminent danger. Expectoration began almost at once, and Hewlett thinks that the mechanic obstruction caused by the exudate produced the symptoms. On the day following an attack the patients almost always presented perfectly normal lungs. Hewlett considers the escape of the fluid to be due to altered permeability of the capillaries and of the alveolar spaces; he thinks that it is impossible that it is the **result of altered blood-pressure**. In some notes of the condition of the fluid he states that it contained

¹ Med. Rec., July 4, 1903.

² Lancet, June 11, 1904.

³ Intercol. Med. Jour. of Australasia, Dec. 20, 1903.

7.5 % of albuminous bodies and 0.728 % of salts, these being about the amounts found in the blood. Mucin was absent.

E. Tiedemann¹ has made a study of the clinical diagnosis of **hemorrhagic infarct** of the lung, chiefly from the observation of a series of cases at necropsy. He refers to the usual teaching concerning the clinical diagnosis of this condition, most authors considering localized large rales of various qualities to be the most common sign. Bronchial breathing is also thought to be characteristic. Tiedemann's observations post-mortem showed that, as is usually thought, the infarct is of a wedge shape, lying near the periphery, and often causing the pleura to project. The size varies greatly. The infarct is free from air, hard, and dry. All these points are of importance in clinical diagnosis. When, as is usual, the infarct is superficial, it causes localized dulness; and there is often a coincident tympanitic note, the latter being due to relaxation in the surrounding lung-tissue or to a note transmitted from an underlying large bronchus. Tiedemann insists that there is not sufficient recognition of the fact that **in the infarct itself no rales or breath-sounds are produced**, the abnormal sounds heard being produced in the tissue surrounding the infarct. These surrounding tissues may, however, exhibit bronchial breathing; they do exhibit large numbers of rales, and there may be a pleural friction. The distribution of infarcts that Tiedemann has observed at necropsy is as follows: in 15 cases, the right lower lobe; in 7, the right upper lobe; in 5, the left lower lobe; in 4, the left upper lobe; and in 2, the right middle lobe.

E. Fabian² reports a remarkable case of chronic icterus in which there was a hemorrhagic tendency that ultimately involved the bronchi and led to terrible attacks of dyspnea and cough, during which casts of the bronchi were brought up. These **casts consisted of blood-clots**. The patient finally died, apparently of hemorrhage, and not of suffocation. The clots showed a cast of the main bronchus and of at least 3 finer divisions of the bronchi. One cast was evidently not only from the bronchus, but also from the upper part of the esophagus. The casts were of a deep-red color, had the consistency of blood-clots, and were not lamellated. The occurrence of the hemorrhage in this case was evidently due to chronic disease of the liver. The case is considered to be one of the few instances in which actual blood-clots have been formed in the bronchi and coughed up. A similar though less marked condition occurs in tuberculosis of the lungs; but it is not common, because the blood is usually poured out rapidly from actual small ruptures of the vessels, and is quickly coughed up. In this case it was a **parenchymatous hemorrhage** that occurred slowly and gave opportunity for clot-formation.

A. D. Mackenzie³ reports a case of **parasitic hemoptysis** due to infection with the **Distoma Westermanii**, the patient being a Japanese of the province of Okayama, where this infection is very common. He was at first thought to have phthisis, on account of the chronic hemoptysis;

¹ Zeit. f. klin. Med., Bd. 1, Hefte 1 u. 2.

² Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 1 u. 2.

³ Jour. Am. Med. Assoc., April 30, 1904.

but evidences of tuberculosis were absent, and the presence of the distoma was determined through finding their eggs. The condition is briefly discussed.

F. F. C. Demarest¹ reports the case of a man of 42 years who complained of hemorrhage from the respiratory tract. Two years previously he had presented signs of consolidation of one apex, without tubercle bacilli in the sputum. With one hemorrhage a fragment of tissue was coughed up. This was examined and **found to be carcinomatous**. The patient died very suddenly, about 3 months later, and an autopsy was not secured.

A. Hönig,² in discussing **syphilitic disease** of the lungs in adults, expresses his belief that the condition is much more frequent than it is commonly thought to be. He thinks that whenever a patient is suffering with chronic disease of the lung one should consider the possibility of syphilis. This, of course, is more common in the tertiary than in the secondary stage; and, when it exists, it is practically always accompanied with signs of syphilis elsewhere. The symptoms closely resemble those of tuberculosis, but tubercle bacilli are absent, unless the two diseases exist coincidentally. In syphilis the **general condition is relatively good** and the apices are less commonly involved, as syphilis ordinarily affects the middle and lower lobes. With energetic and early treatment the prognosis is good.

J. E. Squire³ reports an interesting case of **hydatid disease** of the lung that occurred in a girl of 22 years, who, while teaching, had a violent and prolonged fit of coughing. She finally brought up a piece of membrane "the size of the palm of the hand," the cough and the choking sensation being immediately relieved. Two years previously she had been operated on for tuberculous disease of the ankle-joint. She afterward had cough and hemoptysis, and was thought to have pulmonary tuberculosis. Her symptoms became much aggravated after an attack of influenza with pneumonia and pleurisy. After the first time the patient repeatedly coughed up membrane, which had the appearance of hydatid membrane. The physical signs over the lungs were noted below the angle of the right scapula, where there were the evidences of a cavity. No daughter-cysts or hooklets were ever discovered; and, under treatment, the patient improved greatly, and finally left the hospital with the **signs of a dry cavity** in the situation mentioned. Among the points of interest is the source of infection, which had probably been a pet dog that had previously been known to be much troubled with tape-worms; and the time of the rupture of the cyst, the patient having no history of a sudden gush of fluid through the air-tubes. It was thought possible that the pleurisy previously diagnosed had really been the **escape of the fluid from the cyst into the pleural cavity**. It is possible that the hemoptysis and the pleurisy may both have been due to tuberculosis, and that the hydatid cyst had had nothing to do with these accidents. There was probably slight tuberculosis of the apex of the right lung.

¹ Med. Rec., Jan. 16, 1904.

² Inaug. Dissert., Bucharest, 1903.

³ Lancet, Aug. 8, 1903.

DISEASES OF THE DIGESTIVE ORGANS.

DISEASES OF THE MOUTH AND ESOPHAGUS.

C. Meuse¹ discusses the **variations in the amount of potassium cyanid** in the saliva, having been led thereto by the fact that it had been stated that in tropical aphthas potassium cyanid is absent. He found women and children to have less of this substance in their saliva than have men, and that habitual smokers most frequently give positive reactions. The mercurial treatment of syphilis causes the reactions to become reduced, but untreated syphilis does not. Meuse thinks that further studies in this direction may be of clinical importance.

H. Monscourt² reports a case of **phlegmonous glossitis** that appeared without any definite cause and developed very suddenly. The tongue swelled with great rapidity to an enormous size. By the fourth day it had become so large that it projected from the mouth, caused great disturbance of breathing, and made it impossible for the patient to take food. After incision, the swelling rapidly disappeared, and the patient had become entirely well by the end of a week.

W. Lublinski³ discusses the **complication of acute throat-inflammations by acute thyroiditis**. He states that he has seen 4 such cases, none of which were complicated by suppuration. All occurred in young women, between 20 and 30 years of age, none of whom had previously shown any signs of disease of the thyroid. They were taken ill with the appearances of ordinary acute sore-throat, and five or six days afterward they showed a new access of moderate temperature, with painful swelling and tenderness of the thyroid. There was usually, also, marked rapidity of the pulse, even after the attack had passed off. In one case a return of the sore-throat after 6 months was associated with a new attack of acute thyroiditis. Therapeutically, Lublinski considers the use of ice to be the most satisfactory measure. He suggests that the cases may have been manifestations of rheumatism.

K. Sakata⁴ has made a study of the **lymphatic vessels and glands connected with the esophagus**, particularly with relation to the extension of esophageal carcinoma. He made many injections of the bodies of children by Gerota's method, and discovered two separate sources of the lymph-vessels, one in the deeper layers of the mucous membrane and the other in the muscular layer. No connection exists between these two sources; they empty, however, into the same vessels, these vessels running directly to the glands on the same level. The glands in the supraclavicular fossa receive their lymph chiefly from the cervical part of the esophagus; but a great many lymph-vessels of the thoracic portion of the esophagus empty into the cervical vessels also. Some lymph-vessels from the cervical part empty into thoracic glands. The anterior superior cervical esophageal glands, which lie at the level of the point of

¹ Arch. f. Tropen- u. Schiffshyg., 1903, No. 7.

² Gaz. des Hôp., 1903, No. 34.

³ Berl. klin. Woch., Oct. 12, 1903.

⁴ Mitth. a. d. Grenz. d. Med. u. d. Chir., Bd. xi, Heft 5.

division of the carotid, are in the immediate neighborhood of the recurrent laryngeal nerve, and this **explains the frequent paralysis of that nerve** in esophageal carcinoma.

Hampeln,¹ discussing the **pathology of carcinoma of the esophagus**, emphasizes the fact that it has but a slight tendency to produce metastasis. In 60 cases he found no record of metastasis to any organ. If, therefore, metastasis be found in any supposed case of esophageal carcinoma, the correctness of this diagnosis must be subject to question. The disease has a distinct tendency, however, to propagate itself into the contiguous organs, and it also tends to perforate. Profuse hemorrhage occurs but rarely. The most common situation is in the lower part of the esophagus. One should be very cautious in making this diagnosis when a stenosis is noted in the upper portions of the esophagus.

Schutze² exhibited to the Berlin Medical Society specimens from a case in which during life there had been the signs of esophageal stenosis, and in which examination had shown a **gumma of the trachea**. Under treatment, the dysphagia had improved, but had soon become worse again, and a gastric fistula had to be established. Pulmonary gangrene soon afterward caused death, however, and the postmortem showed that the disease, which was apparently luetic, had begun in the trachea and had caused perforation of the esophagus.

DISEASES OF THE STOMACH.

Methods of Examination.—Bonniger³ has made a study of Sahli's method of investigating the function of the stomach. After a careful discussion of the matter he comes to the conclusion that the older methods are still the most important, and will remain so, although Sahli's method is likely to prove **useful in studying certain questions**. W. Zweig and A. Calvo⁴ have investigated the same question, and agree with Bonniger that this method is useful only when the fat is retained in the stomach in homogeneous mixture. This is not the case in many instances of chronic gastritis and in marked motor insufficiency. The authors think, also, that in subacidity and in possible anacidity the method is a poor one, as the test-meal does not cause sufficient secretory stimulation. HCl may be found after a Ewald breakfast, but be absent after the Sahli meal. The authors believe, however, that the method is important in studying nervous dyspepsia; and that it permits of a distinction between atony and alimentary hypersecretion to an extent that has previously been impossible. The method is, however, **too complicated and too prolonged for use in general practice**.

E. A. Aronson⁵ has made a study of the Sahli test-meal and now reports his results. He particularly notes that the soup is not homogeneous; that the test is not applicable in general practice; that the time consumed

¹ Petersb. med. Woch., 1903, No. 42.

² Zent. f. inn. Med., Jan. 6, 1904, p. 31.

³ Wien. med. Woch., 1903, No. 43.

⁴ Arch. f. Verdauungskr., Bd. ix, Heft 3.

⁵ Med. Rec., Dec. 5, 1903.

is not commensurate with the advantages from the use of the method; and that in every case there is a lack of agreement between the clinical diagnosis and that established by this method. He thinks, however, that it is perhaps possible by this method to **determine the existence of functional disturbances**, when it is not possible to demonstrate such disturbances by other methods.

A. L. Benedict¹ has modified his method of studying **gastric proteolysis** by precipitating the albumin with heat, and all further products by means of phosphomolybdic or phosphotungstic acid. The two precipitates may be readily distinguished and read off.

G. Joachim² has studied a series of cases in relation to the question of the importance of determining the **presence of blood in the feces**. In no case has he been able to find blood in the feces when it was not explainable upon the basis of gastrointestinal disease, except when the patient had recently eaten blood-containing food. In the latter cases subsequent examinations were negative. Of the malignant tumors of the digestive tract, 19 in number, he found blood in all but one, which was a carcinoma of the esophagus. In gastric ulcer he found blood in 83 % of 28 cases. In these cases it did not occur regularly, but from time to time in considerable amount. **In carcinoma it was found almost regularly in small amount.** He did not find it in tuberculosis of the intestine, but did in several cases of typhoid fever; and he believes that small amounts of blood discovered by Weber's test **may be a premonitory sign of dangerous hemorrhage**. The test was negative in gastritis, gastropotosis, and other disorders of the digestive tract, with the exception of one case of *Balantidium coli* infection. It was repeatedly found in cases of venous stasis; also in catarrhal icterus, secondary carcinoma of the liver, etc. In the latter instances it probably indicated a primary tumor of the digestive tract. Since it is found in many conditions, it is not positively diagnostic of any one condition; but it is probably of **value in following the course of a disease**, more particularly that of ulcer. One has to exclude blood coming from hemorrhoids and menstrual blood. This can usually be done grossly, by observing that such blood is found only on the surface of the feces.

R. C. Kemp³ has made a series of observations upon various substances concerning their **fluorescent properties** and their usefulness in **transilluminating the stomach**. The most satisfactory method that he has found is to administer on an empty stomach a glassful of water containing from 15 to 20 grains of sodium bicarbonate; and then a second glass containing the same amount of sodium bicarbonate, 1 dram of glycerin, and $\frac{1}{2}$ of a grain of fluorescin. An examination is then made with the gastrodiaaphane. Kemp finds that the results are much better than when water alone is used.

H. W. Lincoln⁴ has used transillumination of the stomach with fluorescin after the manner of Kemp; and states that he has successfully examined persons of all weights up to 175 pounds, and of all thick-

¹ Am. Jour. Med. Sci., Feb., 1904.

² N. Y. Med. Jour., Feb. 13, 1904.

³ Berl. klin. Woch., May 2, 1904.

⁴ Med. Rec., Apr. 23, 1904.

nesses of the abdominal wall. He believes that it is a valuable method of observation.

W. Alexander¹ discusses **vocal fremitus of the abdomen**, particularly referring to the observations of De Brun and Weber. The first of these authors has observed abdominal fremitus in a collection of fluid in the abdomen; and the second, when gas was present in the abdominal cavity. Alexander has made many observations on patients, and also some animal-experiments; and has reached the conclusion that the explanations advanced by De Brun and Weber for their observations are incorrect; that one cannot give any theoretic reason why abdominal fremitus should occur; and that in his experiments and clinical observations he has never been able to observe the presence of abdominal fremitus. Since this symptom may have some clinical importance, however, he considers that it should be further studied.

A. Abrams² discusses what he terms the **cardiosplanchnic phenomenon**, which is obtained by percussing the lower sternal region, first in the recumbent and then in the standing posture, and noting a decided alteration in the percussion-tone. This alteration is the cardiosplanchnic phenomenon, and he discusses its origin. The phenomenon may be intensified by placing a vacuum-cup on the abdomen. He considers the phenomenon important in the **diagnosis of dilation of the heart from pericardial exudate**, since he states that it does not occur in the latter. It is also excessively marked in syncope and vertigo of idiopathic origin, and is, he believes, of value in other affections.

GENERAL CONSIDERATIONS CONCERNING GASTRIC DISEASE.

Z. Inouye³ doubts that Volhald's conclusions concerning the **fat-splitting ferment** of the gastric juice are correct. He has made a clinical and experimental study of the question, and believes that there is but exceedingly slight splitting of neutral fat in the stomach; and that what there is can probably be attributed to the action of free acid and to bacteria.

K. v. Stejskal and E. Axisa⁴ discuss the changes in the **gastric secretion following unilateral extirpation of the kidney**, having been led to this by the observation, in a number of cases, that soon after the development of a nephritis the secretion of hydrochloric acid in the stomach became greatly reduced. They report observations on 3 animals, which showed the same conditions following unilateral nephrectomy. An explanation for this cannot be given at present; but the authors believe that it is **not a mere reflex condition**, since it was some time after the extirpation of the kidney before the changes in the gastric condition became evident. They think that there is some direct connection between the chemie changes in kidney-extirpation and the gastric secretion.

¹ Berl. klin. Woch., Oct. 26, 1903.

² Am. Jour. Med. Sci., Jan., 1904

³ Arch. f. Verdauungskr., Bd. ix, Heft 3.

⁴ Zent. f. inn. Med., Sept. 19, 1903.

Sinnhübert¹ has made a study, in man and in animals, of the **muscular closure of the cardia**, chiefly through the use of the esophagoscope. He decides that the cardia is constantly in a condition of tonic contraction. This is aided by the muscle of the diaphragm, which surrounds the esophagus; and the closure of the cardia is also made firmer by the fact that the esophagus empties diagonally into the stomach. The contraction of the cardia is due to the action of two opposing forces, a contracting and a relaxing, the former being the stronger. The control of the contracting force is situated near the cardia itself, while relaxation is controlled by the central nervous system. If the vagus is cut directly above the diaphragm, the cardia relaxes. If the vagus is cut high up, the muscle-tone of the cardia is for a short time increased.

E. Rautenberg² discusses **antiperistalsis of the stomach**, and states that this condition has been observed and described only with extreme rarity, and that most of the cases in which it has been mentioned as occurring have not been observed with sufficient accuracy to demonstrate that actual antiperistalsis was present. He reports 2 cases in which antiperistalsis was observed: in one, carcinoma of the pylorus was present; in the other, dilation and ptosis of the stomach. Inflation of the stomach in these cases demonstrated positively, Rautenberg believes, that the movements simulating antiperistalsis were really such and occurred in the stomach. He thinks that such observations indicate that **antiperistalsis may occur in any part of the digestive tract**, since the stomach is merely a portion of the whole intestinal canal. [We believe that the last-mentioned conclusion is correct.]

H. Stern³ describes a series of cases of **aerophagia**. The symptoms produced he has seen mistaken for typhoid fever, appendicitis, enterocolitis, and other diseases; but recovery occurs after the eructation of large amounts of odorless or almost odorless gas, and usually quite rapidly. He has found many of these cases in drivers, horseback-riders, and automobilists. He describes several cases at length. In many instances this condition is hysteric, and has to be treated as such. If it is not hysteric, it should be managed by means of the stomach-tube, to permit of the exit of the air. This should be followed by irrigation with water containing chloroform-water, the use of hot stupes, etc. Stern believes that the air sometimes passes freely into the intestines, and may produce cramps and other symptoms. In such cases he permits nothing except ice and water to be swallowed until the intestines have been evacuated. [The author seems to us to magnify greatly the frequency and importance of this condition.]

Pal⁴ thinks that the **gastric crises observed in tabes dorsalis** are due to spasm of the small mesenteric vessels. He finds that the blood-pressure is increased both before and during the attacks, and that with reduction in the blood-pressure the pain ceases. These are, therefore, in his opinion, chiefly vascular crises, due to **irritation of the vasoconstrictors of the splanchnics**.

¹ Zeit. f. klin. Med., Bd. 1, Hefte 1 u. 2.

² Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 3 u. 4.

³ N. Y. Med. Jour., Feb. 20, 1904.

⁴ Wien. klin. Woch., 1903, No. 43.

Paviot¹ reports a case of *tabes dorsalis* in which, after persistent constipation, **uncontrollable vomiting appeared and finally became feculent**. Laparotomy showed the intestine to be normal, although ileus had been suspected. Autopsy showed a normal intestine, but the patient had a psammoma in the floor of the fourth ventricle, which had compressed the vagus nucleus.

Fischer² discusses **gastric vertigo**, describing three general classes of cases. In the first class the gastric symptoms are relatively slight as compared with the nervous symptoms; in the second, the vertigo occurs chiefly in relation with improper diet; in the third, the vertigo is associated with chronic gastric disease. The second class is quite common; the third, still more so. Patients that show vertigo with gastric disease are likely to have signs of general neurosis.

ABNORMITIES OF SECRETION.

F. Riegel³ discusses **hyperacidity and hypersecretion**, making a definite distinction between the two conditions, and insisting that it is quite feasible to distinguish between them clinically. The usual reason that these are confused is that observers do not often investigate the fasting stomach. Hypersecretion, he believes, is not always merely an evidence of disturbed motility. It is often combined with ulcer and conditions of that kind; but, he thinks, not necessarily. Among the methods of **distinguishing between hypersecretion and hyperacidity and motor insufficiency** he mentions, first, the macroscopic appearance. In hypersecretion there is a **remarkable excess of fluid, as compared with solid substance**, after a test-meal. In motor insufficiency the solid substance is much finer; while in hypersecretion there are larger masses, and the solid substance rapidly separates from the fluid. The specific gravity is low in hypersecretion. In motor insufficiency one finds a high value for combined HCl, while this value in hypersecretion is low. A patient with hyperacidity often has relatively mild symptoms as compared with the high acid-value; while a patient with hypersecretion always has more or less troublesome symptoms. Riegel believes that **alimentary hypersecretion is only a mild grade** of the more severe condition. He thinks that an albumin-fat diet is the most important point in dietetics, oil-treatment having value. Atropin helps somewhat, also, as does lavage. He thinks that operation is never indicated in pure hypersecretion.

C. von Noorden,⁴ discussing hyperacidity of the gastric juice and the treatment of this condition, refers to certain cases in which marked hyperacidity is found without any gastric symptoms. He also insists that in a large number of cases **hyperacidity and severe constipation** are associated, and that the one intensifies the other. The hyperacidity can often be cured, or the patient at least rendered very comfortable, by

¹Soc. méd. des Hôp. de Lyon, Oct. 3, 1903. ²Med. News, July 11, 1903.

³Deut. med. Woch., May 12 and 19, 1904.

⁴Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

controlling the constipation; but the latter, he insists, must be controlled by dietetic measures chiefly—aided somewhat by the use of mineral waters. He also strongly emphasizes the fact that many cases of hyperacidity, particularly of the purely neurasthenic type, are **due to general bad nutrition**; and that overfeeding and improving the general nutrition will produce results that are impossible by any other method. He states that in treating ulcer, also, he often gives by the end of the second week as much as 3500 to 4500 calories a day; and he believes that this is a much more successful method of treatment than the method of slowly increasing the diet.

H. Strauss,¹ in discussing alimentary hypersecretion, says that he considers that this disorder bears a **close relation to hyperacidity and ulcer**, particularly to cases of hyperacidity in which there is gastropotosis. He thinks that it has no essential connection with motor insufficiency, though it produces stagnation and may produce motor insufficiency. The latter, with stagnation of the intestine, may be overcome; but it may for a long time leave behind it an excessive irritability which produces a hypersecretion. Strauss thinks that one should treat the cause; namely, ulcer, gastropotosis, etc. As to diet, he leans toward one that is **rich in milk-fats**, and contains a normal quantity of albumin and also a moderate quantity of carbohydrates.

GASTRITIS.

N. B. Foster,² discussing chronic gastritis **due to alcohol**, refers to a class of cases in which there are no symptoms of gastric disorder, but in which examination of the stomach-contents shows low or absent free hydrochloric acid. He considers this important, on account of the occasional danger of mistaking such cases for carcinoma. He believes that they cannot be called chronic gastritis, but a change in gastric secretion due to alcohol. [We see no definite reason for separating these cases on clinical grounds from those of alcoholic gastritis.]

G. W. McCaskey³ discusses his observations in **600 cases of chronic gastritis**. Anacidity was found in 20%; subacidity, in 26%; normal acidity, in 34%; and hyperacidity in 20%. McCaskey believes that the motor power is frequently disturbed in chronic gastritis. He discusses the treatment, particularly insisting upon the value of the general management of such cases. He condemns the frequent and prolonged use of lavage, but he has had good results from electricity.

H. Elsner⁴ discusses the question of **hemorrhagic erosions** of the stomach and the propriety of considering erosions of the stomach to furnish a distinct clinical type of disease. He has investigated 120 cases as to the occurrence of fragments of mucous membrane; and has found that they are never present in the normal stomach, but that they indicate a pathologic state. Thirty-five cases showed marked secretory anoma-

¹ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

² Am. Jour. Med. Sci., Apr., 1904.

³ N. Y. Med. Jour., Aug. 15, 1903.

⁴ Deut. med. Woch., Oct. 8, 1903.

lies; and in 12 of these particles of mucous membrane were found. They were also found frequently in chronic gastritis and in achylia gastrica; more rarely, in other diseases. In most of the 12 cases in which these particles were found there were no symptoms referable to them. Elsner also discovered that the patients who had ceased to have these evidences of erosion after careful dieting, nevertheless, in some instances, soon after exhibited these distressing symptoms again, without having any further evidences of erosion of the mucous membrane. He thinks, therefore, that the name hemorrhagic erosion, as indicating a disease, should be given up until at least some postmortem evidences of the correctness of such a designation have been furnished. One may wisely, however, look for the occurrence of these **erosions in cases of chronic gastritis** in which the patients have much pain; but, if discovered, the author does not believe that this fact should greatly alter one's view of the case. He has found that washing the stomach with a solution of silver nitrate, as recommended by Einhorn, is useful.

GASTRIC ULCER.

I. Boas,¹ discussing the **diagnosis of gastric ulcer by means of the discovery of occult hemorrhages**, especially emphasizes the importance of examining the feces for this purpose, as one can thereby avoid using the stomach-tube to obtain gastric-contents. This will also prevent the possibility of the danger and discomfort attending the use of the tube, and the error caused by its introduction, which sometimes produces slight hemorrhages. The patient should not have eaten any form of rare meat for at least 24 hours before the examination, and hemorrhage from the lower end of the intestinal tract and also menstruation must be carefully excluded. Hemorrhage is not constant in ulcer, but does occur in a large proportion of cases. Boas particularly insists that this method of observation is **important in determining the degree of recovery**. If a cure has been effected, the blood will disappear from the feces within a short time; while if blood is still present in the feces, the cure cannot be considered complete. He believes that in this way it is more important in prognosis than almost any other fact; except, of course, the persistence of violent symptoms. It is a good method of testing the value of different forms of treatment and the period throughout which the treatment should be prolonged. His method of examining the feces is to take 5 or 10 grams of feces; if hard, mix with a little water; add about 20 cc. of ether, to extract the fat; then add 3 cc. to 5 cc. of acetic acid; and, after this, introduce the mass into a test-tube and again extract with ether. Alcohol should never be added. To this mixture with ether the author adds a little powdered guaiac, shakes thoroughly, and then adds 20 to 30 drams of oil of turpentine or dilute hydrogen peroxid. A violet or bluish color, which becomes more marked upon adding chloroform, develops if blood is present. The results are sometimes doubtful. In that case the method of Klange and Schaer is valuable. This consists in taking a little aloin

¹ Deut. med. Woch., Nov. 19, 1903.

on the point of a knife-blade, and putting this in 3 cc. to 5 cc. of 60 % to 70 % alcohol. One takes the acetic-acid-ether extract of the feces or of the gastric contents and adds 20 or 30 drops of turpentine, and then 10 or 15 drops of the fresh aloin-solution. If blood is present, there is a bright-red color, which soon becomes a fairly permanent cherry-red. If no blood is present, a red color appears only after an hour or so, and is then slight. This test, also, is much more marked when chloroform is added.

J. W. Russell¹ has made a study of the **subsequent history of 89 cases of gastric ulcer**, and has succeeded in tracing the history of 47. In 16 of these the history of the patients since the occurrence of ulcer was brought up to date. All these patients had been cared for by purely medicinal means, and in all the diagnosis was considered to have been definitely settled through the occurrence of hematemesis and other symptoms. Only 2 of these patients had died: one, "of her former complaint"; and the other, of acute tuberculosis. A total of 27.7 % reported themselves as practically entirely well; 14.9 % still had some stomach symptoms, but had probably recovered from the ulcer; 6.4 % were on the border-line between recovery and continuance of the disorder; while 44.7 % still had more or less severe gastric symptoms. In 29.8 % of these the pain was almost continuous. Upon the whole, Russell thinks that these statistics **favor the view that operation should be more frequently resorted to** in gastric ulcer. He notes that the occurrence of a second hemorrhage indicates prolongation of the symptoms.

GASTRIC ATONY AND DILATION.

Mangelsdorf² has observed that the **stomach enlarges during attacks of migraine**, afterward returning to its normal size. He therefore investigated 409 cases of migraine in which he was able to outline the stomach before, during, and after attacks, and found that only one patient had a stomach of normal size. This patient was a girl of 14 years in whom the attacks of migraine had but recently begun. The author describes a case in which the stomach was found 30 cm. below the sternum, gradually retracting after the attack until the lower border was but 10 cm. below the sternum. Another attack caused the lower border to sink to about 40 cm. below the sternum, the organ again contracting within 2 days. Mangelsdorf thinks that this enlargement of the stomach is secondary, but that when it occurs repeatedly, it results in atony and in more or less permanent enlargement of the organ.

J. H. Salisbury,³ in discussing atony of the stomach, refers to some observations concerning the **importance of the splashing sound**. Fifty-one cases were examined. The tenth rib was found loose in 30 cases—17 men and 13 women; and was free in 6—2 men and 4 women. Salisbury found movable tenth rib accompanied with splashing sound in 75 % of the cases, while this sound was present in but 20 % of the cases in which the tenth rib was fixed. He believes that movability of

¹ Lancet, Jan. 30, 1904.

² Berl. klin. Woch., Nov. 2, 1903.

³ Medicine, Sept., 1903.

the tenth rib indicates arrest of development, connected with imperfection of the abdominal organs. The latter manifests itself in atony of the stomach and of the intestines, as well as of the ligamentous tissues and the skeletal muscles, especially of the abdomen.

H. Richartz¹ reports a case of **gastric tetany** in a woman of 32 years. The attacks began after washing out the stomach. Operation was undertaken, and showed a **large number of prune-stones** in the stomach, with dilation of the organ and a mass at the pylorus. The patient believed that the stones must have been present in the stomach for at least 15 months, and probably for many years. The tetany disappeared immediately after the operation and did not return. Exclusive rectal alimentation had not had this effect. This fact Richartz believes to indicate that the tetany in this case was toxic.

B. G. A. Moynihan,² in discussing gastric tetany, states that he considers this condition much more common than it is usually thought to be, the slighter degrees often being overlooked. He gives a general discussion of the symptomatology of the condition, and notes that in several instances he has seen a dusky lividity of the parts affected. He has often found that the agony of the spasms may be relieved by **forcibly bending the fingers**, hands, or forearms, or by reproducing passively the movements that would be caused by the active contraction of the muscles involved. In 3 cases out of 5 that he has operated upon he has found **duodenal ulcer with gastric ulcer**. He thinks that the recorded cases show a large proportion of instances of duodenal ulcer. He insists that lavage should be carried out, and that this should be done with the utmost thoroughness until the wash-water is clear.

Hourglass Deformity.—Sternberg³ demonstrated to the Vienna Medical Society a case in which, with marked kyphoscoliosis, there appeared, synchronously with every respiration, a **loud noise over the stomach**, the point of greatest intensity being Traube's space. It had the character of a stenotic sound. It could not be produced by the patient or by the examiner through the action of the abdominal muscles. Sternberg believes that, **as a result of the kyphoscoliosis**, there had been produced an hourglass-like deformity of the stomach; and that the noise was made at the point of constriction.

TREATMENT OF CHRONIC GASTRIC DISEASE.

F. H. Murdoch,⁴ in discussing the treatment of chronic gastric disease, insists upon the importance of making the patient **persist in taking a fluid diet** for a much longer time than is customary. He refers to one case in which the pain returned a few weeks after the patient had resumed solid food, while all the symptoms disappeared again after restriction to fluids for 4 months. He believes that fluids should be used until the epigastric tenderness has entirely disappeared.

¹ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

² Boston M. and S. Jour., Nov. 5, 1903.

³ Wien. med. Woch., 1903, No. 34.

⁴ Amer. Med., Sept. 19, 1903.

G. Norström¹ gives an extensive discussion of the treatment of gastrointestinal troubles with massage. He particularly insists that, contrary to the views of many authors, massage, if continued long enough, will frequently cause improvement in hyperchlorhydria. It may, at first, slightly increase the condition; but will afterward, he thinks, produce improvement. He has had no satisfactory results from the use of massage in attempting to improve the position of the stomach in gastropotosis. In treating constipation, he has a **special method of massage**: The patient is placed on his right side, which makes the small intestine fall over to that side, and makes it easier to reach the sigmoid flexure, which is the most important part of the intestines to be massaged. He gives the various details that he recommends in carrying out massage, particularly advising deep massage of the bowel itself, and not of the abdominal wall. It commonly requires several sittings before massage of the bowel can be properly performed in a person unaccustomed to it. [While massage is useful, we have failed to get any such brilliant results as those described in this paper.]

Von Tabora² has made a study of the **absorption of albumin** in cases of disturbed gastric secretion, testing the power of the digestive apparatus to absorb large amounts of albumin, rather than simply normal amounts. As the result of his studies he comes to the conclusion that in normal or increased gastric secretion, or even in cases with a moderate decrease in the secretion, large amounts of albumin are absorbed quite normally; but that in practically all cases in which there is **achylia gastrica**, the **albumin is absorbed much more poorly** than when the stomach-secretion is normal or increased. The use of large amounts of acid in such cases increases the absorption decidedly—as a result, he thinks, of its exciting effect upon the pancreatic secretion. **Administering large amounts of alkalies reduced the absorption** of albumin in all the cases; this being due, also, he thinks, to its negative effect upon the secretion of the pancreas. His results stand in more or less contrast with the view that has recently prevailed concerning the lack of importance of the chemic functions of the stomach.

G. Lang³ has made a study of the **influence of water, carbohydrates, fats, and proteids** upon the gastric secretion of man. He contributes a considerable series of detailed experiments, from which he concludes that, of the substances examined, proteids alone have in man any influence in exciting the secretion of gastric juice. This is a point of teleologic interest, because proteids alone require gastric juice for their digestion. There seems to be a difference in the use of egg-albumen and of water between man and the dog. In the dog water excites the secretion of gastric juice; while egg-albumen, unless given with much water, does not. In man water causes scarcely any secretion, while egg-albumen decidedly increases the secretion.

S. Simnitzki⁴ discusses the question of the **influence of carbohydrates**

¹ Med. Rec., Feb. 6, 1904.

² Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

³ Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 3 u. 4.

⁴ Zeit. f. physiol. Chemie, Bd. xxix, p. 99.

upon the decomposition of albumin. He has studied the influence upon bacterial decomposition exerted by the albumin on the addition of varying quantities of sugars, and finds that the sugars **decrease the putrefactive processes**, although different sugars have decidedly different actions. The restricting influence of milk-sugar was more marked than that of glucose or galactose, while the latter had a more marked action than glucose. The influence of these sugars is due to the acid produced from them. These results explain to some extent the varying action of different kinds of carbohydrates in the diet.

O. Loewi¹ has made a series of interesting experiments on the **influence of clysters upon peristalsis**, particularly studying the question whether visible peristaltic or antiperistaltic movements are produced by these clysters. He opened the abdomen in a bath of normal salt-solution carefully kept at body-temperature, and then accurately observed the behavior of the intestine. The most important observation made by him is that active peristalsis was set up, and in a number of instances he **observed antiperistalsis**. The important practical conclusions reached are that nutritive enemas may be used with disease of the stomach or of the upper part of the small intestine; they **should not be employed in appendicitis or in typhoid fever** at the time of the casting off of the sloughs, since in the ileocecal region there is likely to be active excitation of peristalsis. Loewi believes that it has been definitely shown that these enemas may produce actual antiperistalsis that may be of very marked degree, and he purposes to study the effect of adding various substances upon the peristaltic and the antiperistaltic movements.

H. D. Rolleston and A. J. Jex-Blake² have made a series of observations upon cases receiving nutritive enemas, and have observed the **frequent occurrence of vomiting in such cases**. They have not found any relation between the nature of the food given by the rectum and the vomiting. In some cases it was apparently due to decayed teeth that had produced sepsis, and in 2 instances the vomiting stopped after such teeth had been extracted. The authors found that, in all, 27 % of cases of gastric ulcer fed exclusively by the rectum vomited without definite cause. While in some instances this was attributed to **oral infection**, in others it was probably a **reflex result** of the rectal injections.

Trolldenier³ has made a study of the effects of the **subcutaneous administration of the Heyden food-preparation**. He decides that after subcutaneous injection the albumin in this preparation is not excreted in any considerable amount in the urine, and is, therefore, used for the nutrition of the organism. The injections, however, were painful and often caused inflammatory swelling of the skin, with, in some cases, the production of abscess. He ultimately succeeded in producing a clear, sterile solution which contained 8 % of the peculiar body (standing chemically between the native albumins and the albumoses) and 0.6 % of sodium chlorid. This solution was used in 2 animals, in one for nearly 3 weeks, and in the other for over 10 days, without producing any unfavorable results.

¹ Zeit. f. klin. Med., Bd. I, Hefte 3 u. 4.

² Brit. Med. Jour., July 11, 1903.

³ Berl. klin. Woch., Oct 5, 1903.

H. Winternitz¹ discusses the previous work concerning **subcutaneous nutritive fat-injections**, and the somewhat uncertain conclusions that have been reached by the methods adopted as to the degree in which these injections undergo actual absorption and assimilation. He has adopted a new method for determining the degree of assimilation of such fats, injecting iodine-fat compounds beneath the skin, and then determining the amount of iodine excreted in the urine. This indicates the degree in which these compounds have actually been split up and assimilated. The animals used were all in a condition of extreme subnutrition; Winternitz therefore believes that any fat of use to the organism would have been split up. He finds that fats so injected are actually used by the organism, but in such extremely slight degree that subcutaneous fat-injections, as now used, **cannot be considered to have any therapeutic value**. For instance, only 2 or 3 grams of fat were absorbed within 5 days, and it was months before 500 grams so injected were absorbed. At best, he states, one can provide the patient with 20 to 25 calories a day by this method. His studies were carried out with both animals and human beings.

F. Loebe² has made a careful study of the substance called **dyspeptine (Hepp)**, which has been greatly lauded by various writers for the treatment of gastric disorders. It is supposed to be a natural gastric juice. Loebe's studies of the substance indicate, however, that it has **no resemblance whatever to gastric juice**, and that it is apparently of no value.

H. D. Rolleston,³ in opening a discussion on the **treatment of gastric ulcer**, noted that thirst is not relieved so well by rectal injections of water as by taking water by the mouth. He referred to the influence of dryness of the mouth in causing infection of the mouth, and also to the **influence of pyorrhœa alveolaris and similar conditions** in producing or continuing infection and irritation of the stomach. [An observation that should be heeded in carrying out treatment.] He likewise stated that patients with gastric ulcer who are fed by the rectum show, in a strikingly large number of instances, the occurrence of parotitis; and he believes that parotitis is particularly likely to arise in patients with dry mouths. He thinks that one should give plenty of water by the bowel, but that the value of nutritive enemas, as food, is questionable. He also thinks that in gastric ulcers in men over 30 years of age potassium iodide should be tried, as these ulcers are sometimes syphilitic. He thinks that operative intervention is justifiable when there is constant pain that leads to invalidism and is not relieved by medical measures, and also when there is intermittent or permanent pyloric obstruction and when hematemeses recurs in spite of medical treatment.

R. Saundby stated that his method is to put all the patients that show vomiting, accompanied with pain after taking food, in bed, and to feed them on one ounce of milk in lime-water every hour, gradually increasing the quantity given. If there has been vomiting of blood, nothing is given

¹ Zeit. f. klin. Med., Bd. I, Hefte 1 u. 2.

² Deut. med. Woch., Mar. 10, 1904.

³ Brit. Med. Jour., Oct. 24, 1903.

by mouth for 2 days. He has had about 200 cases under his care, and only one patient has died.

W. Collier spoke of his experience in over 180 cases in which the diagnosis of gastric ulcer had been based upon the occurrence of hemorrhage in connection with other symptoms of ulcer. He especially noted that **although hematemesis is very alarming, it rarely causes death.** Of his cases, not one has been fatal. [This corresponds with our experience, but not with that of all others by any means.]

W. Ewart described an apparatus that he had improvised for the purpose of carrying out **continuous rectal alimentation.** This apparatus consists of the barrel of a 4 or 5 ounce glass syringe with a rubber-tubing attached to its nozzle. This ends in a male rubber catheter, to be introduced into the rectum. A coil or two of the conducting tube is placed in a basin of warm water. The flow is regulated down to a very small stream by means of a screw-clamp. The administration of food may, in this way, be kept up for the greater part of the day, and within 12 hours 2 pints can be introduced and retained.

G. Parker had found the use of **calcium chlorid** by the mouth to be very helpful, not only in relieving hemorrhage, but also in preventing pain and nausea. He, with other speakers, insisted upon the **importance of administering plenty of water by the bowel.** [A valuable point that is too often neglected.]

A. Hartz¹ reports a case of benign stenosis of the pylorus in which many methods of treatment had been used with only temporary success. The patient had been constantly going down-hill, and it had been decided that operation was necessary. He was, however, put on **thiosinamin**, a 15 % alcoholic solution being given hypodermatically. The dose employed was usually a syringe-ful of this solution. Under this treatment, carried out for several months, the patient improved so much that Hartz believed him to be likely to become entirely cured. He was still under observation when the case was reported.

GASTRIC CARCINOMA.

W. Ziegler,² in discussing **HCl-hyperacidity in the early stages of carcinoma** of the stomach, states that in 5 out of 10 cases he noted that there was an excessive amount of HCl present in the very early stage of carcinoma without any signs of ulcer at that time or previously, or any evidence of decided nervous excitability. The patients had previously been free from gastric symptoms. In **considering the diagnosis** of beginning carcinoma of the stomach with HCl-hyperacidity, he states that it is important to note that all the measures that are commonly more or less effectual in the treatment of hyperchlorhydria are, in this condition, ineffectual. There is likely to be a marked distaste for meat, as is so common in cancer. The patients are usually elderly or old persons, while hyperchlorhydria commonly occurs earlier in life.

¹ Deut. med. Woch., Feb. 18, 1904.

² Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

G. Honigmann¹ reports an interesting case in a man of 42, who for a long time had had symptoms of nervous hyperacidity. He then had an attack of apparently acute gastroenteritis, with subsequent symptoms of atony and decided hyperacidity and hypersecretion. There was improvement in this; but there occurred a sudden change in the picture, consisting in a loss of muscular power and the development of an acidity. Subsequently to this there were attacks of tetany. These led to operation, which disclosed pyloric carcinoma with widespread fresh metastases. The tetany disappeared after this, but the case ran a rapid course toward death. Honigmann thinks that Riegel is right in believing that there may be an actual hypersecretion, without pyloric obstruction, ulcer, or ectasy; as apparently none of these were present when the man had evident hypersecretion. He thinks that the transformation in the picture, with the appearance of an acidity, and even the tetany, were due to carcinomatous intoxication, basing this view largely upon the evidently rapid development of metastases.

D. L. Edsall and C. A. Fife² report a case of pyloric carcinoma in which the symptoms strikingly resembled those of gastrocolic fistula. They also discuss the symptoms of the latter condition. The patient was a man of 59 years, who had had the general symptoms of pyloric carcinoma without any distinct local signs; but who had feculent vomiting, the vomit and the stools being of the same general character. After using enemas of eggs and milk, the man vomited material containing more than 4% of fat. Postmortem examination showed, however, that there was no fistula, but a pyloric carcinoma, which had compressed the pylorus into a rigid channel. The vomiting is thought to have been due to reversed peristalsis; and it is believed that the enemas had been carried throughout the whole length of the bowel, the feculent vomiting being much favored by the permanently patulous condition of the pylorus.

G. W. McCaskey³ reports a case of combined pyloric carcinoma and phlegmonous gastritis in a woman of 29 years. The chemic conditions in the gastric contents were those common in carcinoma, with considerable pus; and there was violent gastric disturbance. At postmortem there was found a cancer of the pylorus with an abscess-cavity about 1½ inches in diameter.

H. Salomon,⁴ in discussing the diagnosis of carcinoma of the stomach, refers to a method that he has recently adopted, which consists in looking for a considerable amount of serum-albumin in the stomach-contents. His reason for this is the suspicion that if an ulcerating carcinoma is present, serum-albumin will escape in a considerable amount into the stomach. The stomach is thoroughly washed out the evening before the examination. The next morning 400 cc. of physiologic salt-solution is introduced into the stomach. This is siphoned out, allowed to run in again, and again siphoned out. The nitrogen of this

¹ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

² Amer. Med., Oct. 10, 1903.

³ Med. Rec., Oct. 10, 1903.

⁴ Deut. med. Woch., July 30, 1903.

fluid is then estimated by the Kjeldahl method, and its albumin-content by Esbach's. Salomon gives his results from a series of examinations. So far as he has gone, he has found in carcinoma of the stomach, and practically only in this disease, that a considerable amount of albumin is shown by Esbach's method; and there is much more nitrogen than in other disorders of the stomach. He thinks that one should be suspicious of the existence of carcinoma if this wash-fluid exhibits a **flaky turbidity upon the addition of Esbach's reagent**, or if its nitrogen-content is more than 20 mg. to 100 cc. of wash-water. He believes, however, that it is quite possible than an intense chronic catarrh of the stomach may produce similar conditions; and also that these conditions would be found in gastric carcinoma only when the carcinoma is ulcerated—therefore, when it is probably fairly well advanced. The negative side of the test is likely to be the more important. Salomon believes that if there is no reaction with Esbach's reagent, an ulcerative process in the stomach is improbable. [The statement probably does not refer to "peptic ulcer."]

J. Sigel,¹ in some observations concerning the diagnosis of carcinoma of the stomach, particularly refers to the method of Salomon for determining the albumin in the stomach-contents. He concludes that this is **not a reliable method**, because in the series of observations that he reports, particularly in gastric ulcer, the amounts found were sometimes so high as to approach those seen in carcinoma. He also does not believe that a negative result of the test makes an ulcerative process in the stomach improbable. He has likewise made a study of Gluzinski's method, and thinks that this may sometimes be useful, but that it is not reliable. Rosenfeld's method of determining quantitatively the volatile fatty acids of the urine in the diagnosis of gastric carcinoma he considers entirely unreliable. [We have had extensive experience with the latter method in various diseases, and are positively convinced that it is unreliable as a method of demonstrating the presence of any definite disease.]

H. Elsner² reports 2 cases that are interesting in relation to the **diagnosis between esophageal and gastric disease**. In the first case, that of a woman of 39, the history showed prolonged difficulty in swallowing, with marked emaciation. It was possible, with difficulty, to pass a sound into the stomach; and the gastric contents showed the conditions usually found in gastric cancer. It was discovered, however, that fluids, in amounts as large as 200 cc., were retained for some time in the esophagus. The gastroduaphane would pass readily into the stomach. The gastric contents contained a small amount of blood. The conditions, therefore, indicated gastric carcinoma. Laparotomy was carried out, and this diagnosis was confirmed. The **esophageal symptoms were evidently due to spasm**. In the second case, that of a woman of 60, the patient gave the history of a diverticulum high up in the esophagus. Fluids caused this to become distended, and it was possible for her to empty the fluids from the diverticulum after swallowing them. This condition had persisted for a number of years. There

¹ Berl. klin. Woch., Mar. 21, 1904.

² Deut. med. Woch., 1903, No. 24.

had been moderate emaciation, but shortly before she was observed she had begun to emaciate rapidly. There was a hard, rough tumor in the pyloric region, which had all the characteristics of pyloric carcinoma, and the inguinal glands were enlarged. It was impossible to pass a tube into the stomach. Gastrostomy was carried out in this case, but the patient died a few months later of exhaustion and progressive emaciation. A diverticulum was found at the level of the seventh cervical vertebra. **The tumor in the abdomen proved to be the gallbladder filled with gallstones.** In this case it is probable that an operation on the diverticulum would have saved the patient's life.

R. Kaufmann and W. Schlesinger¹ discuss some of the **biologic characteristics of the long lactic-acid-producing bacilli** that occur in the gastric contents (the Oppler-Boas bacilli). They describe in detail their results, and reach the conclusion that an acid reaction in the medium used, when due to organic acids or to acid phosphates, favors the growth of these organisms—unless the acidity reaches a high point. Their results in relation to gastric carcinoma are as follows: The most important point in providing conditions for the growth of these organisms in the stomach is absence of free HCl and coincident stagnation of the stomach-contents. Such stomach-contents also contain a sufficient quantity of sugar, because the saliva has an opportunity to act; and sugar favors their growth, through the production of organic acids. The organisms are much more resistant to the lactic acid produced than are other lactic-acid-forming organisms. It is possible that the absence of pepsin, etc., also favors their growth.

Sandberg,² in discussing the reason for the presence of the long Oppler-Boas bacilli in the gastric contents when lactic acid is present, states that his observations indicate that this is due to the **great resistance of these organisms to lactic acid**, other lactic-acid producers being greatly restricted in their growth in the same circumstances. The primary type of these bacteria consist of short bacilli; but as soon as the lactic-acid-producing power is developed, or as soon as other bacteria produce lactic acid in large amount, the Oppler-Boas bacilli tend to grow into the usual long forms.

S. Heichelheim³ discusses his **studies of small blood-clots** obtained from stomach-contents **with reference to the presence of Oppler-Boas bacilli** in them, and their importance in the diagnosis of gastric carcinoma. There are mentioned 43 cases in which HCl was absent, and 20 of these were certainly carcinoma. Small clots were found in all the cases of carcinoma, with three exceptions, and the bacilli were usually present in enormous number. In the cases in which there was great motor power of the stomach these bacilli were not present. They were found in cases in which ferments were still demonstrable in the stomach, contrary to the view of Hammerschlag. These bacilli in blood-clots are of importance only when present in great number, but they are **found thus**

¹ Zeit. f. inn. Med., Jan. 30, 1904.

² Zeit. f. klin. Med., Bd. li, Hefte 1 u. 2.

³ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

in most cases of gastric carcinoma, even in the early stages, and Heichelheim believes them to be of decided importance in the diagnosis. They are frequently found, indeed, in cases in which a considerable amount of HCl is present. A moderate number of them increases a suspicion of carcinoma.

C. Rudinger¹ reports a case of gastric carcinoma in which it was observed that the urine became bloody and in which examination of the urine showed a great many bacilli which were determined by cultures to be Oppler-Boas bacilli. They also had the microscopic appearance of these organisms. Necropsy in this case showed that there was a carcinomatous metastasis into the pelvis of the kidney. There was no evidence that these organisms had reached the blood-stream and thereby infected the pelvis of the kidney, and Rudinger thinks that the bacteria probably passed through the intestine and thus infected the kidney. He found a large number of these bacteria in the intestine. The hemorrhage into the pelvis of the kidney furnished a good culture-medium for the growth of the bacilli. It was found that the bacteria grew well in urine to which blood had been added.

R. Schmidt² demonstrated to the Vienna Medical Society a preparation from the stools of a patient with gastric hemorrhage in which there were a great many bacilli which culture in 20 % glucose-agar had shown to be Oppler-Boas bacilli. This finding had led to the diagnosis of probable carcinoma of the stomach. A further observation of the case had confirmed this diagnosis. In discussion, E. Schwarz mentioned a case in which these bacilli had been found in the sputum in large numbers. This had led him to believe that the patient had pneumonia resulting from the perforation of carcinoma into a bronchus.

V. E. Mertens³ has made some observations concerning the serum-diagnosis of carcinoma, which he thinks entirely unsatisfactory. He describes various methods that he has attempted to use. He more particularly tried to exclude the blood-precipitins, which were inevitably present, by first precipitating them out with a serum specific to human blood-serum. He thinks, however, that the results have been such as to make the method, as yet, purely hypothetical, without any practical value.

W. Alexander-Katz⁴ thinks that much can be done in the prophylaxis of carcinoma of the stomach if one insists that the patients shall be careful to protect the stomach as much as possible from damage. He believes that carefully chewing the food, taking it in a form in which it cannot cause mechanic damage to the stomach, and using a fairly large quantity of fluid with the meals are important points in protecting the patients from the development of gastric cancer. [These are perfectly rational observations so far as they go, but they add little to previous knowledge or therapeutics.]

J. A. Storck⁵ has used radium in a series of cases of gastric carcinoma,

¹ Zeit. f. inn. Med., Feb. 6, 1904. ² Zeit. f. inn. Med., Jan. 9, 1904, p. 34.

³ Deut. med. Woch., Feb. 4, 1904. ⁴ Deut. med. Woch., Nov. 19, 1903.

⁵ Amer. Med., May 21, 1904.

with some improvement in the symptoms, particularly the pain. Otherwise the condition of the patient remained practically unchanged.

M. Einhorn¹ describes some **capsules** that he has made to use in treating the stomach, esophagus, and rectum locally with radium.

Syphilis.—H. A. Lafleur² reports a case of gastric syphilis in which an exploratory laparotomy was undertaken during life, and the diagnosis was positively confirmed by histologic examination of a portion of the growth. The previous treatment had been ineffectual, but the use of antisiphilitic treatment caused rapid improvement and ultimately entire cure, which had persisted for more than a year at the time of the report.

DISEASES OF THE INTESTINES.

P. Grützner,³ discussing the difficulties met with in searching for calculi and the like in feces, states that many of these **difficulties may be overcome by using brandy**, instead of water, to suspend the feces, and doing the mixing in a cylindric glass. He also employs a method that, he states, is rapid, simple, and satisfactory, to divide the feces. He **uses a form of domestic egg-beater**, consisting of a handle to which is attached a spiral spring of conic form. This is pressed down, so that all the spirals lie on a horizontal level, and then allowed to spring up. This is continued until, after a few movements, the whole mass has been finely divided. In the alcoholic mixture one may easily determine the character of any of the larger masses present. Grützner also states that by this method he has almost regularly found a spectroscopic band in the alcoholic extract. This finally proved to be due to chlorophyl. He thinks that a study of the feces carried out by this method of breaking them up may lead to the discovery of some facts previously unknown.

R. Baumstark⁴ describes a method of using Ehrlich's **dimethyl-amidobenzaldehyd reaction as a quantitative test for indol** in the feces. He believes that in determining the degree of putrefaction in the intestine one should always determine the indican and the ethereal sulfates of the urine, and also the amount of indol in the feces. He has found the amount in the feces increased in cases of constipation, achylia, hyperchlorhydria, pernicious anemia, and chlorosis, and decreased in diarrhea. In one case of peritonitis he found a small amount of indol in the feces, but an enormous amount of indican in the urine.

A. Oppenheim⁵ discusses the changes in the **position of the liver and of the thoracic organs in meteorism**, in their relation to diagnosis and treatment. The disappearance of the anterior liver-dulness in meteorism is, he considers, due to rotation of the organ on its axis, and this is due almost entirely to the distended colon. The bowel, he thinks, does not ride over the liver, but pushes it up, so that it presents its narrow edge anteriorly. He reports a case that he believes demon-

¹ Med. Rec., Mar. 5, 1904.

² Montreal Med. Jour., 1903, No. 7.

³ Deut. med. Woch., Oct. 29, 1903.

⁴ Arch. f. Verdauungskr., Bd. ix, Heft 3.

⁵ Berl. klin. Woch., Oct. 19, 1903.

strates this. He has also made experiments on this point. He likewise notes one case in which obstruction of the pylorus was diagnosed, but in which it was noted that with the contractions in the upper part of the abdomen, then thought to be peristaltic contractions of the stomach and liver, dulness alternately disappeared and reappeared. Laparotomy showed an inoperable carcinoma at the splenic flexure of the colon, and made it evident that the variations in the liver-dulness had been **due to the stiffening of the intestine that caused rotation of the colon.** Oppenheim believes that this **may be an important point in diagnosis.** He also insists that it is possible to produce death from mechanic disturbance of the heart in meteorism. Experiments on animals, as well as clinical observation, have convinced him that this is definitely true; and he has also observed that the lower limits of the lungs are found two or three fingerbreadths higher than in health, when meteorism is present. This is very likely to simulate subphrenic abscess or pleural effusion in such instances, and one must be careful in such circumstances that if he punctures, he does not go through into the liver.

A. Mueller¹ believes that **gynecologic conditions frequently cause intestinal disturbance.** The sacrouterine ligaments surround the intestine in fork-like form, about 14 to 16 cm. above the anus. When these ligaments undergo chronic inflammatory change, they become shortened and stiffened, and tend to produce a purely mechanic stenosis of the intestine. Coprostasis, with resulting proctitis and periproctitis, is, he believes, also the most common source of parametritis—contrary to the usual opinion. In the diagnosis of chronic inflammation in the ligaments one should test their elasticity and their sensitiveness. Examination with the spectrum is usually of comparatively little value. One may sometimes, however, see a stenosis; and above it small nodules, which are likely to be very tender.

J. C. Thresh² reports an **interesting epidemic of diarrhea** that was due to the **pollution of a public water-supply** and affected the borough of Chelmsford and the village of Widford. It occurred during the summer of 1903. In all, 54 cases occurred, many of them in adults, and most of the persons attacked were over 5 years of age. The symptoms were those of severe acute enteritis and gastroenteritis, in some cases suggesting ptomain-poisoning. It was found that the cases occurred solely in those who had been using water from a certain source. This water was stored in a small uncovered reservoir, which had been polluted from near-by manure, etc., owing to the heavy rains. As soon as the use of this supply had been stopped, the epidemic disappeared. Fourteen deaths from diarrhea occurred during this period, all in the area supplied with water from the infected source.

F. Vincent³ reports a case of **acute colitis** that he believes to have been **due to milk-poisoning.** It occurred in a man of 32, and was associated with severe swelling of the glands, influenzal symptoms, and an attack of jaundice. These were followed by symptoms of acute colitis,

¹ Arch. f. Verdauungskr., Bd. ix, Heft 2.

² Brit. Med. Jour., Sept. 26, 1903.

³ Brit. Med. Jour., Feb. 6, 1904.

which rapidly progressed to a fatal issue. Postmortem examination showed the appearances of acute toxemia in the liver, in some respects simulating acute yellow atrophy, with widespread tuberculosis of the interlobular vessels. The large intestine was soft and edematous. The mucous coat was either absent or necrotic. There was little inflammation and no ulceration. Spitta considered the changes to be due to tuberculosis of branches of the portal vein. The origin was thought to have been milk, because for some time the patient had been drinking milk from a supply demonstrated to have been the cause of a number of cases of "septic" sore-throat. The cases of the latter kind showed acute follicular tonsillitis, and many of them afterward had enlarged and sometimes suppurating cervical and submaxillary glands. At times there were acute rhinitis, pharyngitis, acute edema of the glottis, inflammation of the parotid and of joints, and also erysipelas. In one case there was acute glossitis with Ludwig's angina. The latter patient recovered under the use of antistreptococcic serum.

G. Edlefsen¹ discusses the occurrence of **an acute sigmoiditis**, and insists upon his previously expressed view that this does occasionally occur as a separate and distinct affection. He believes that it is a localized form of acute peritonitis due to fecal accumulation. He has observed it especially in his earlier cases, particularly in puerperal women; and it was repeatedly thought at first to be parametritis. It is, however, **possible to distinguish it** by observing that the mass lies well toward the left; that one can feel definite fecal tumors; and that even if the uterus is inflamed, there is a painless and nontender area between the uterus and the fecal mass. Moreover, after the intestine has been emptied, the symptoms subside within a few days. The disorder is associated with marked fever, local pain, tenderness, and with decided general disturbance. Edlefsen presents his reasons for considering this a distinct local peritonitis.

P. W. Bassett-Smith,² in discussing **sprue**, refers to the fact that residence in the far East is almost always found in the history of these cases. He does not believe that sprue is always connected with dysentery, but thinks that it is of **bacterial origin**. He mentions the fact that often it does not develop until long after the patient has left the tropics. He publishes a **series of blood-counts** in 2 cases of this sort. In the first case the red cells dropped down to near one million, and then gradually improved. The patient ultimately recovered entirely. In the second case, which was fatal, the blood-cells also dropped to near a million, and abundant myelocytes appeared. The blood-changes were similar to those of pernicious anemia, but large nucleated cells were not present and the hemoglobin-value was low.

W. B. Clark referred to a variety of what he terms sprue frequently seen in Barbadoes. In this **there is pigmentation of the skin and lunacy is common**. G. C. Low said that he thinks the condition mentioned by Clark is not sprue, but **pellagra** or a closely allied disease. J. Cantlie insisted upon the importance of using **minced meat in the treat-**

¹ Berl. klin. Woch., Nov. 30, 1903.

² Brit. Med. Jour., Sept. 19, 1903.

ment of sprue, 5 ounces 3 times a day being given. **Antiscorbutic treatment** should also be employed. K. W. Goadby mentioned a series of bacteriologic investigations in cases of sprue that he had been making—so far, with negative results.

P. Cohnheim¹ believes that **bismutose** is an excellent astringent in cases of chronic catarrh of the intestine, etc., particularly in alcoholics, and especially when given over a period of several weeks at least.

H. Lohrisch² has made a study of **absorption in chronic habitual constipation**, and finds that the feces contain a remarkably small amount of dry substance, this being due to an **abnormally extensive absorption of the food**. The consequence of this is that the intestinal bacteria find an unfavorable medium for their growth. The absence of fermentative and putrefactive processes takes away an important means of exciting intestinal peristalsis. Consequently there is a slowing of the intestinal movements and habitual constipation, and one point of therapeutic importance in this is that such cases **do not need treatment of the motor apparatus**.

W. Ebstein³ describes the results that he has obtained by using **exodin**, a new laxative, which is employed in doses of 7 to 10 grains. He has found the preparation excellent as a mild purgative, and it has been valuable in many cases of persistent constipation.

APPENDICITIS.

D. Cuziner⁴ agrees with the view that appendicitis is often the **result of an autointoxication** produced by the excessive eating of meat. As an evidence of this, he notes that in the hospital at Bucharest there is one case of appendicitis to every 234 patients. The class from which these patients are drawn eat relatively large amounts of meat, while Roumanian country-people, who live mainly upon vegetables, show only one case of appendicitis to every 22,000 sick persons. [This view seems a little overstrained.]

Schultes,⁵ discussing **influenza and appendicitis** and their relation to each other, refers to the observations that he has made in soldiers since 1896. The majority of the cases of appendicitis appeared in the winter, when influenza was epidemic; and during the last 2 years an unusual number of cases of appendicitis have occurred, while there have also been an unusually large number of cases of influenza. When the conditions were investigated a little more closely, however, it was found that most of the cases of appendicitis occurred when there was no influenza in the battalion, and that they also occurred in men who had already had repeated attacks of appendicitis. Three cases of appendicitis were, Schultes believes, actually the result of influenza. These are described in brief detail. The conclusion reached is that it has, as yet, by no means

¹ Berl. klin. Woch., Dec. 28, 1903.

² Deut. Arch. f. klin. Med., Bd. lxxix, Hefte 5 u. 6.

³ Deut. med. Woch., Jan. 1, 1904.

⁴ Inaug. Dissert., Bucharest, 1903.

⁵ Deut. med. Woch., Oct. 15, 1903.

been demonstrated that appendicitis has increased to any considerable extent as the direct result of influenza. This disease may readily produce catarrhal changes in the intestine, and the latter may, of course, be the cause of appendicitis, but Schultes does not believe that this is nearly so common as many authors think.

Villaret¹ discusses the **question whether inflammation of the appendix is becoming more** frequent than it has been. He believes that it is not, but that more cases are observed merely on account of better diagnosis. If this view is correct, one should find, with the increase in the number of cases of appendicitis, a corresponding decrease in the number of instances of disease previously referred to the liver, stomach, and peritoneum. His observation of the statistics in the army shows that while appendicitis has increased by 70 % since 1873, diseases of the liver have decreased by over 64 %; diseases of the peritoneum, by over 70 %; and chronic diseases of the stomach, by nearly 80 %. The number of cases of all these diseases has decreased by 44.5 %. Hence Villaret concludes that the **increase of appendicitis is only apparent**.

Middeldorp² reports an unusual case of acute appendicitis in which, the day after the man had been seen, which was 2 weeks after the beginning of his illness, there were sudden evidences of **embolism of the right femoral artery**. The man afterward developed gangrene of the leg, and amputation was necessary. He recovered entirely. There was no evidence of endocarditis, or of trouble other than the appendicitis, as the cause of the embolism. The author also gives a brief report of a case of thrombosis of the right femoral artery.

K. Faber³ reports 5 cases of **obliterative appendicitis**. From the conditions in these cases and in others reported he decides that obliteration of the appendix is always due to previous inflammatory conditions, and not to senile involution-processes. It is not more common in the aged than in the young, and may occur at any age. It often runs its course without producing any typical symptoms, but it may cause signs of chronic appendicitis, and may be associated with very troublesome adhesions.

E. Stadler⁴ discusses the **value of leukocyte-counts in diseases of the appendix**, basing his observations upon a study of 70 cases. He believes that studying the leukocytes is one of the most important means of distinguishing the cases of simple fibrinous exudation from those that tend to abscess-production or have actually reached the latter stage. In the first class there is a moderate increase in the number of leukocytes, but, in his experience, never to a point above 23,000, and this rapidly decreases. If the leukocytes increase in number, or if they even once reach a high point (over 25,000), this speaks strongly for suppuration and for the necessity of surgical intervention. After the abscess-cavity has been emptied, the leukocytes rapidly decrease in number. If the pus has not a free vent, the count remains high. Leu-

¹ Deut. med. Woch., Jan. 1, 1904.

² Deut. med. Woch., July 30, 1903.

³ Mitth. a. d. Grenz. d. Med. u. d. Chir., Bd. xi, Heft 4.

⁴ Mitth. a. d. Grenz. d. Med. u. d. Chir., Bd. xi, Heft 3.

kocytosis, however, is not sufficient to determine the character of the appendicitis. If an abscess becomes encapsulated, the leukocytosis gradually decreases to normal or nearly so. In the diagnosis of general peritonitis the number of the leukocytes is not, in itself, of extreme importance; but their **tendency to decrease or increase in number is of great importance**. In the rapidly fatal cases there is only a slight increase in the number of white cells. In the cases that have early been treated with proper surgical measures and have followed a favorable course the leukocytes increase in number to a high point. The degree of the leukocytosis is, therefore, a fairly good indication of the resisting power of the organism. [In a general way this is a very fair statement of the case. It should be remembered that the condition of the blood constitutes only a part of a general clinical picture, a fact that is not appreciated by overenthusiastic advocates or opponents of blood-examinations or other laboratory methods.]

W. Russell¹ contributes a general discussion of the **diagnosis of acute appendicitis and of the indications for operation**. He does not believe in the general rule to operate at once. If severe pain continues, in spite of local applications and the use of belladonna internally, it is an indication for operation. The same is true of the recurrence of severe paroxysms of pain, and also of the persistence of pain and tenderness over the cecum after 48 hours, even though the general condition seems to be improving. **Persistent tenderness without pain** is likewise of great importance. He thinks, also, that one should operate in any case with a history of previous attacks or if the onset has been with a rigor. One should operate, likewise, in cases showing constitutional disturbance with only little local evidence of disease. In other cases he believes that hot or cold applications and the sparing use of opium, morphin, or belladonna are indicated. He thinks that lavage may give good results. [The observations of Loewi which have been mentioned are sufficient to indicate the possible danger in the general use of lavage in such cases.]

DYSENTERY.

Jürgens² discusses an epidemic of dysentery that he **observed in Berlin**. In this epidemic he isolated a bacillus practically identical with that of Flexner. He discusses the importance of the **serum-reaction**, and decides that it is not definitely specific, but is a valuable help in diagnosis.

L. Rosenthal³ discusses the production of a **dysentery-toxin** by a natural method. He used a weak alkaline Martin's bouillon, any other reaction having been found to produce only a weak toxin. The optimum temperature was 36° to 37° C. The amount of toxin was greatest after about 3 weeks. At this time the filtrate from a Chamberland filter was exceedingly toxic, 0.1 cc. producing severe symptoms rapidly, and causing death within from 24 to 48 hours. Postmortem examination of the ani-

¹ Lancet, Mar. 19, 1904.

² Zeit. f. klin. Med., Bd. li, Hefte 5 u. 6.

³ Deut. med. Woch., Feb. 11, 1904.

mals showed hemorrhages throughout the intestinal tract, particularly in the colon, with localized necroses in the colon; also cloudy swelling and fatty change in the liver and kidney. The toxin is not destroyed by heating to 70° or 100° C., although it becomes weaker.

B. Markwald¹ reports a case of dysentery in which, after the course of the disease, agglutination-tests with the bacillus of Shiga were positive; and in which urethritis and conjunctivitis occurred, followed by iridocyclitis and rhinitis. It was not determined whether these complications were due to the dysentery bacillus or not.

C. F. Craig² contributes a preliminary note concerning the life-cycle of *Amoeba coli* in the human body, referring to his previous observation of objects that he considered to be spores; and stating that, by a modification of Wright's method of staining, he has been able to study these objects carefully and to note some previously undescribed changes in the ameba. He describes various differences in the amebas, some of the most striking points being changes from a large-sized collection of chromatin, usually situated at one side of the parasite, into a division of the chromatin into two nearly equal portions, and then into a great many small clumps, the chromatin then being surrounded by an unstained interval in the endoplasm of the ameba. At this time the collections of chromatin are small and more compact, and stain very deeply. They are also oval in form and of exactly the same size. Craig thinks that these divisions of the chromatin, which afterward become arranged regularly throughout the organism, form a portion of the nucleus of young spores; and he thinks that in several instances he has been able to differentiate a narrow zone of pale-blue protoplasm surrounding each clump of chromatin, thus demonstrating the outline of the spore. He has never been able to observe the actual rupturing of the ameba and the setting free of the spores.

T. B. Fletcher³ contributes a statistical study of 120 cases of amebic infection that have been observed in the Johns Hopkins Hospital. Of these cases, 119 were amebic dysentery or amebic abscess of the liver, the remaining case being amebic abscess of the floor of the mouth. Of these, 82 were apparently contracted in Baltimore, and 13 others in the State of Maryland, outside that city. The youngest occurred in a child 2 years and 8 months old, and 11 % occurred during the first decade. There were 108 males and 11 females. The leukocyte-count was lower in the uncomplicated cases than in those with hepatic abscess, on the average; but this is not a reliable method of determining the presence of abscess. Hepatic abscess was observed in 22.6 % of the cases. In 9 cases the abscess ruptured into the right lung; in 2, into the right pleura; and in 3, into the inferior vena cava. Ten cases showed single large abscess, and 8 showed multiple abscesses. Perforation of the colon occurred in 3 cases, and severe intestinal hemorrhage in 3. A striking feature was the great tendency to relapse. The percentage of fatal cases was 23.5.

¹ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

² Amer. Med., Feb. 20, 1904.

³ Jour. Am. Med. Assoc., Aug. 22, 1903.

Of the 27 cases of abscess, 19 were fatal; 17 were operated upon, and 5 of these recovered. Fitcher believes that quinin-irrigations gave the best results in treatment.

A. Lambert, in discussion, noted the frequency of **severe, painful cramp in the muscles** in amebic dysentery.

T. J. Moore had found these cramps frequent, especially in acute cases.

C. F. Mason recommended, in the treatment, thorough dilation of the sphincter and **careful examination of the mucous membrane of the rectum**; and said that one almost always finds some ulceration. These ulcers are treated by slitting them to the bottom and curetting, or by touching them with pure carbolic acid. The bowels are afterward kept well washed out with normal salt solution. All his cases, with one exception, had been cured.

H. F. Harris noted that favorable results had been obtained in his cases with **hydrogen dioxid**.

R. L. Kurtz¹ reports a case of amebic dysentery in a woman of 25 years. It finally ended fatally, and autopsy showed, besides dysenteric changes in the bowel, **scattered abscesses in both lungs**. The liver showed no abscess-formation. Kurtz particularly notes that after other treatment had been unsuccessfully used, the intestinal symptoms were rapidly controlled to a large extent by employing acetozone. The case was, however, too far advanced to permit of arrest. He also states that the patient had a pet cat which had had a prolonged and severe diarrhea, and that epidemic dysentery had existed among the cats of the neighborhood. The patient had apparently **acquired the disease at home in Illinois**, and Kurtz thinks that she may have taken it from this pet cat.

C. Neuninger² discusses the **cardiac disorders observed in dysentery**, and reports a series of 14 observations of more or less severe cardiac disturbance produced by this disease. These disturbances varied from irregularity to paroxysmal tachycardia, and even to severe valvular lesions. The latter were probably due chiefly to secondary infections. Six of the 14 cases remained permanent invalids, owing to the cardiac involvement.

C. Todd³ contributes a preliminary paper on a **dysentery antitoxin**, the chief points determined being that by growing the dysentery bacillus in a somewhat **highly alkaline bouillon**, a soluble toxin is obtained; and that to this toxin certain animals, particularly the horse and the rabbit, are very susceptible. The toxin is fairly stable, and is not destroyed by a temperature of 70° C. maintained for an hour, although that of 80° C. maintained for the same length of time will kill it. When injected into suitable animals,—the horse, for example,—the toxin gives rise to a powerful antitoxin. Todd finds that a combination of the toxin and the antitoxin *in vitro* does not take place immediately, but requires a certain length of time, and that the rapidity of combination varies with

¹ Medicine, Sept., 1903.

² Arch. f. Schiffs- u. Tropen-Hygiene, 1903, No. 11.

³ Brit. Med. Jour., Dec. 5, 1903.

the temperature. He also finds that a prophylactic dose of the serum protects absolutely, when given an hour before the toxin; but that if the antitoxin is given 24 hours before the toxin, it does not protect. This may be due to the destruction or excretion of the antitoxin within this period.

C. F. Mason,¹ discussing **bacillary dysentery as seen in soldiers**, states that his mode of treatment is to give 10 grains of epsom salts in water every hour until a movement free from blood and mucus occurs, and to follow this by ordinary astringents. He insists that ulcers are frequently found in the rectum, and says that in subacute and chronic cases the patients should be anesthetized, the sphincter should be well stretched, and the rectum should then be carefully examined with the speculum. If ulcers are found, they should be slit up to the bottom, and scraped or touched with caustic; warm saline injections should then be used. After the lesions have healed, **large injections of silver nitrate** give excellent results (1:500 or 1:250).

H. H. Rutherford² discusses the use of **pure olive-oil** in chronic dysentery and allied conditions, describing several cases in which it has been employed, and mentioning a large series. He believes that it acts by stimulating the flow of bile, thus favoring intestinal digestion and intestinal antiseptis. He thinks that he has observed evidences of an increased quantity of bile in the feces, while the number of bowel-movements decreased, as did also the appearances of fermentation and putrefaction. He has observed apparently positive cures after an average time of 2 months or more, with very few recurrences. In all, more than 75 cases have been treated with this method.

L. Kohler,³ in the treatment of tropical dysentery, recommends infusions or fluid extracts of **Cortex granati**, **Cortex simarubæ**, and **campeche wood**. He regularly found improvement, even in bad cases, within 12 hours. He finds that **red wine is particularly harmful** in tropical dysentery, and thinks that it should be replaced with rum or whisky.

W. F. England⁴ reports several cases to illustrate the effects of **Aplopappus Baylahuen**, a drug found in South America, and there considered a specific for dysentery. He has had prepared a fluid extract, giving 20 minims 3 times a day, in cream or milk, as the drug will not mix with water. The results described are very encouraging.

W. B. Burns⁵ believes that there is a **malarial form** of dysentery which responds promptly to treatment with quinin. He refers to the frequency with which lesions of the gastrointestinal tract are noted in the "Medical and Surgical History of the War of the Rebellion." [Subjects of malaria are often liable to disease of the digestive tract; but that there is a real "malarial" dysentery is highly improbable.]

¹ Jour. Am. Med. Assoc., July 25, 1903.

² Amer. Med., Mar. 12, 1904.

⁴ Lancet, Aug. 15, 1903.

³ Therap. Monatshefte, 1903, No. 9.

⁵ Jour. Am. Med. Assoc., July 25, 1903.

VARIOUS DISEASES OF THE INTESTINE.

Dilation and Hypertrophy.—L. Kredel,¹ discussing **congenital dilation and hypertrophy of the large intestine** in children and adults, refers to the literature and considers the causes and the treatment of the condition. He believes that in these cases there is always some congenital abnormality—chiefly abnormal length and movability of the flexures of the intestine. He reports one case that occurred in a man of 21, another in a boy of 10, and a third in a boy of 3 years. In the first case the symptoms were of such high grade that it was decided that there must be some obstruction. Operation was performed, but no obstruction was found. The colon, however, was **bound down in the true pelvis**. When it was freed, the enormously dilated bowel rose into the false pelvis, and the dilation itself was sufficient to keep it there. The symptoms were permanently relieved by this measure. The patient ultimately recovered and remained practically well. In treating the condition Kredel recommends lavage of the colon with large quantities of water, oil, etc. **Massage should be used with great care**, as it may do great damage, particularly when ulcers are present. If obstructive symptoms appear, they should at first be treated medicinally, as they often subside quickly. He suggests that **forcing air into the rectum** may help to overcome these attacks better than introducing large quantities of water. Surgical treatment should be undertaken when the patient is in a condition in which there is severe and persistent diarrhea with prostration. **Continued diarrhea is one of the most serious symptoms** in the disorder, as it indicates ulceration and putrefaction, and is very likely to lead comparatively soon to death. Among surgical measures not yet carried out or suggested he mentions the longitudinal invagination of a portion of the intestine throughout the whole extent of the dilation as a measure that may at times be successful. If this cannot be done, he suggests the possibility of **excising oval portions of the intestinal wall**, which can probably be done without damaging the mucous membrane, and therefore without opening the bowel.

Carcinoma.—T. Rosenheim,² in discussing the diagnosis of carcinoma **situated either high in the rectum or in the sigmoid**, particularly recommends the use of a modified Sims position, the examiner standing behind the patient, introducing the index-finger of the left hand into the rectum, and pressing firmly downward toward the sacrum with the right hand. He believes that by this method one can frequently determine the presence of carcinoma when otherwise it is not accessible. He also uses a position in which he elevates the pelvis, the patient lying on his back. By these two measures he has repeatedly been able to make a diagnosis when the condition would otherwise have been overlooked, even when a previous examination had been made under anesthesia. He does not think that examination under anesthesia is by any means so satisfactory and final as it is often considered to be.

¹ Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

² Deut. med. Woch., March 10 and 17, 1904.

Syphilis.—C. Gutmann¹ reports a case of **multiple intestinal ulcerations**, probably of syphilitic nature. The course of the case was such as to suggest the presence of intestinal tuberculosis. Since there was no evidence of tuberculosis of the lungs, it was thought to be a primary intestinal tuberculosis. Death occurred, and an examination of the intestines showed the presence of about 15 ulcers spread throughout the small intestine. Most of these had resulted in local constriction of the intestine. There was no evidence of tuberculosis upon either gross or microscopic examination. The examination of these ulcers gave no positive and definite evidence as to their nature; but, after having made a study of the literature of the subject, Gutmann has reached the conclusion that it is extremely probable that they were syphilitic.

Intestinal Obstruction.—Hynitsch² reports a case of obstruction of the intestine due to gall-stones. The man had previously had signs of gallstone colic, but was suddenly taken with the symptoms of severe acute intestinal obstruction, for which no cause could be determined. After several days of very severe symptoms there was improvement and the coincident **passage of two large gallstones**, which had probably caused the symptoms. The patient entirely recovered.

DISEASES OF THE LIVER.

J. Bouma³ describes a clinical method for the **quantitative determination of bile in the urine**. It depends upon the use of a color-scale standardized against pure bilirubin. The test is carried out by using calcium chlorid, neutralizing with ammonia, centrifugating, washing, and then testing the precipitate with a mixture of ferric chlorid in HCl (1½ parts of the former to 1000 of the latter, 1 cc. of this mixture being added to 4 cc. of absolute alcohol just before the test is made).

L. Ferrannini⁴ has made a study of the **peculiarities of bile-pigments in various forms of icterus** and the changes that the bile-pigments have undergone as found in the urine. He reports cases at length. He finds the same peculiarities of the pigments as those described by Dastre and Floresco as occurring in bile itself, but all the urines differed in the conditions that they exhibited. In the different cases the individual changes found seemed to be persistent, not varying from time to time to any noteworthy extent. There did not seem to be any marked alterations as the result of allowing the urine to stand for several hours. Ferrannini believes that further investigations of this kind may evolve some points of importance in diagnosis and prognosis.

W. Schlesinger⁵ recommends a **new method for the clinical determination of the presence of urobilin in the urine**. The chief point of the method is that it gets rid of the other pigments. He adds a 10 % solution of zinc acetate in absolute alcohol to an equal amount of urine and then filters off the precipitate. He states that one immediately

¹ Zeit. f. klin. Med., Bd. 1, Hefte 5 u. 6.

² Deut. med. Woch., 1903, No. 36.

⁴ Zeit. f. inn. Med., Aug. 8, 1903.

³ Deut. med. Woch., June 9, 1904.

⁵ Deut. med. Woch., Aug. 6, 1903.

obtains a striking fluorescence and a distinct absorption-spectrum. The fluorescence is much more easily observed with this test, or with any other, if the vessel be lighted up with a convex lens, a convenient method being to use one of the small electric hand-lamps that are now in common use. All watery urobilin solutions give the reaction in a dilution of 2 parts to 100,000. One of the advantages of this method, besides its simplicity, is the fact that it is not necessary to use ammonia, which has a distinct oxidizing effect upon many of the urinary pigments and interferes with a satisfactory reaction. The test may also be readily used with the feces. The author has also used it in studying the blood; but it takes a long time with blood and also a considerable amount of fluid, and most of his investigations with blood have been negative. The large amount of albumin in the blood and the presence of the red blood-corpuscles seem to disturb the results with this test. Schlesinger, however, describes a method that he has used which overcomes these objections to some extent, but which, nevertheless, was negative in 15 cases. [We have found this test extremely satisfactory and simple, and it is probably reliable.]

A. Braunstein¹ refers to the reports of **urobilin in the gastric contents** by Meinel, and gives his observations regarding this point. After investigating a series of cases he has come to the conclusion that urobilin may occasionally be found in the stomach-contents, but he believes that this is due to the backflow of bile into the stomach from the duodenum and to the presence of urobilin in this bile. He believes that he has demonstrated that the amount of urobilin in the gastric contents is directly dependent upon the amount of urobilin in the bile itself. The urobilin contained in the bile is commonly believed to have been formed in the intestine, absorbed therefrom, and then reëxcreted in the bile. Hence Braunstein thinks that the urobilin supposed to be formed in the stomach is really **of the same enterogenous origin as is other urobilin**.

G. Landsberg² reports a series of cases of disease of the liver that he has studied with reference to the presence of **alimentary levulosuria**. His results do not support the conclusions reached by Strauss and others concerning this test. In 21 cases he had the following results: Of 4 cases of carcinoma of the liver, 1 case was positive; of 11 cases of cirrhosis, 4 were positive; of 2 of hypertrophic cirrhosis, both were positive. One case of passive congestion was negative; 1 of icterus with cholelithiasis was negative; 2 cases of chronic obstruction of the bile-duct were positive. In all, only 43 % of the cases showed a positive result. In some instances this was evidently due to diarrhea and to the excretion of the levulose in this way; but this is a very disturbing factor and one that makes the test objectionable. Landsberg states, however, that in many instances the amount of levulose excreted in the positive cases was slight. He also says that he tested 7 apparently normal persons and found an almost equal degree of alimentary glycosuria in 4 of these persons. He believes that the **tolerance for levulose in individual cases**

¹ Zeit. f. klin. Med., Bd. 1, Hefte 1 u. 2.

² Deut. med. Woch., Aug. 6, 1903.

is **extremely variable**, and that alimentary levulosuria is more largely dependent upon individual predisposition than upon disease of the liver. [Our experience with the test has been very disappointing.]

A. Schittenhelm,¹ in discussing the **excretion of ammonia in the urine** of man, agrees that it is usually dependent largely upon the amount of tissue being destroyed, except when large amounts of fat are being consumed, in which case it regularly increases through the production of acids. An excessive secretion of HCl in the stomach increases the ammonia of the urine; with an acidity, the urinary ammonia decrease. In 3 cases of severe degeneration of the liver, 2 of them being cirrhosis and 1 carcinoma, abnormally high values for ammonia were obtained. Schittenhelm, however, administered ammonium salts by the mouth, and found that the ammonia was promptly excreted as urea. There was, therefore, no disturbance of the urea-forming function of the liver, and the high figures for ammonia were **probably due to abnormal acid-production**. This view is strengthened by the fact that the administration of alkalies decreased the ammonia-excretion. Fatty foods, Schittenhelm finds, cause a more marked excretion of ammonia in patients with liver-disease than in normal persons.

W. v. Moraczewski² reports the case of a man of 50 years with the symptoms of biliary calculus who was operated upon without finding a stone elsewhere than in the cystic duct. Cholecystenterostomy was done. The liver-enlargement decreased, but persisted for a long time. The stools were acholic and bile-pigment was present in the urine. While the stools remained acholic for a long time, the bile-pigment soon disappeared from the urine; though the urine contained much urobilin and the feces contained an excessive amount of neutral fat. From this it was decided that there was an insufficient excretion of bile, and studies of the ammonia- and total-nitrogen and of other elements of the urine were made. The **ammonia-nitrogen was found to be from 7 % to 15 % of the total-nitrogen**. This was believed to substantiate the diagnosis.

ICTERUS.

K. Brandenburg³ has made a study of the **cause of the slowing of the pulse in icterus**, particularly investigating the influence of bile upon various portions of the heart. He thinks that he has demonstrated quite clearly that a **reflex irritation of the vagus** is one of the important elements in the slowing of the pulse. The nerves of sensation in the heart are particularly easy to irritate by small amounts of bile in the circulation, and this readily causes reflex irritation of the vagus. The prolonged presence of bile in the blood probably causes **damage to the heart-muscle**, especially near the point at which the large veins empty into the heart. The slowing of the pulse is, therefore, due to these two causes: reflex irritation of the vagus and damage of the cells of the heart-muscle.

¹ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 5 u. 6.

² Zent. f. inn. Med., Feb. 20, 1904.

³ Berl. klin. Woch., Sept. 21, 1903.

L. Nicolaisen¹ reports an interesting **epidemic of catarrhal icterus** that occurred in a portion of Christiania. Of the 84 cases in which the facts were determined, 50 occurred in children and 34 in adults. There was no evidence of direct contagion, but the disease was obviously due to some epidemic infection. There were, however, definite small house-epidemics; and this, with various other facts, made it seem possible that the condition was **mildly contagious**.

Dubousquet-Laborderie,² discussing epidemic icterus, mentions a family, composed of the parents and 3 children, in which all showed icterus with severe symptoms of infection. In this case he believes the infection was due to the fact that the family lived in one of a series of huts occupied by rag-pickers, the infection, supposedly, being carried by the rags. In the second observation he notes several members of a family who showed icterus with signs of infection. In this case there was apparently, also, a **local source of infection**. He discusses infectious icterus, and concludes that it is probably due to a specific infection. The infection commonly comes from polluted water, and is often associated with malaria, diarrheal infections, and typhoid fever. These disorders may occur together with icterus in the same individual. He believes that it is possible for this icterus to spread by actual direct contagion.

L. Metzger³ reports the case of a woman of 45 who presented a condition that he believes to have been a typical instance of the rare disorder originally described by Senator as **menstrual icterus**. She had repeated attacks of icterus that were in close association with the menstrual periods. [There is no convincing evidence in this report that the patient did not have chronic organic disease of the liver, which merely suffered exacerbations at the time of menstruation.]

W. J. Calvert⁴ describes the case of a man of 27 years who had intense **jaundice in association with secondary syphilis**, without fever or digestive disturbance. Treatment with mercury and potassium iodid was followed by the disappearance of the ascites. He refers to 127 cases of syphilitic icterus that he has been able to collect.

ACUTE YELLOW ATROPHY.

C. Neuberg and P. F. Richter⁵ report a case of acute yellow atrophy of the liver in which they determined the presence of **free amidoacids** (leucin, tyrosin, and lysin) **in the blood**. They found such large amounts of tyrosin present that they came to the conclusion that the destruction of liver cannot be the sole cause of the presence of these amidoacids in the urine or blood in acute yellow atrophy. The other possible source is the destruction of muscle-tissue or the absorption of these acids from the intestine. In normal circumstances the amidoacids are absorbed from the intestine, but are built up into other substances—probably into proteids. In acute yellow atrophy this **synthesis does not occur**, according to the

¹ Deut. med. Woch., June 9, 1904. ² Jour. de Méd. de Paris, Feb., 1904.

³ Zeit. f. klin. Med., Bd. lili, Riegel Festschrift.

⁴ Am. Jour. Med. Sci., May, 1904. ⁵ Deut. med. Woch., Mar. 31, 1904.

belief of Neuberg and Richter. They think, however, that in their case there was also a slowing of the normal rate of excretion and a retention of these substances in the blood. [There is not sufficient evidence of the correctness of the view offered. It is not necessary that the total amount of these substances should be formed from the liver-tissue. A vast quantity of proteid-material is constantly being brought to the liver by the blood, and it is not at all impossible that these substances may be formed from this proteid more than from the liver-tissue; nevertheless their excessive formation and presence in the blood or urine would still be a direct result of the liver-disease.]

CIRRHOSIS.

E. Kitschmann¹ states that in a series of cases of atrophic cirrhosis of the liver he has observed the occurrence of a **venous pulse in the veins of the forearms**, and even of the hands, and has reached the conclusion that this has actual diagnostic interest in hepatic cirrhosis. The explanation that he gives of its occurrence is that in cirrhosis of the liver the upper part of the trunk is more or less "pumped out" by the venous congestion in the lower part. The right auricle, therefore, receives less blood than normally. The blood in the ascending cava moves more slowly, also, on account of the ascites and of compression in the hepatic portion of the cava. In so-called pericarditic pseudo-cirrhosis the cava may likewise be constricted above the diaphragm. Further, during inspiration the liver, in normal circumstances, is emptied to some extent, chiefly through the abdominal breathing. This does not occur in marked ascites. Owing to these conditions there is a **much more marked negative pressure during inspiration** and in diastole of the auricle in persons with cirrhosis of the liver than in normal persons. Hence a diastolic collapse is visible in the veins.

F. Parkes Weber² notes that he has recently found in several patients with cirrhosis of the liver a **strong reaction to ferric chlorid**. He has had no opportunity to make further studies of the condition. The cases were in advanced stages of the disease. [Acid-intoxication is known to occur in a large proportion of cases of hepatic cirrhosis in the advanced stages. It was probably the cause of this reaction.]

R. Lenzmann,³ in discussing the **indications for Talma's operation in atrophic cirrhosis** of the liver and the results of this operation, insists that one of the most important explanations of the occurrence of ascites in some cases and its absence in others is the **varying capacity of the heart and of the vessels to carry on the circulation** in cases of cirrhosis of the liver. The cases that have no ascites, he believes, are usually in persons with a good circulation. He considers, however, that Talma's operation is so likely to relieve the general circulation, and thereby overcome the symptoms that have previously been present, that it should be carried out for this purpose whenever contraindications are not present.

¹ Zent. f. inn. Med., Jan. 16, 1904.

² Brit. Med. Jour., Jan. 2, 1904.

³ Deut. med. Woch., Nov. 26, 1903.

He thinks that the cases suitable for this operation are those in which there is no evidence of advanced change in the liver, but marked evidence of local stagnation in the portal circulation, with ascites, etc.; also those in which there is considerable change in the liver, but **no evidence of marked disturbance in the liver-function.** [Lenzmann apparently considers marked icterus as the chief indication of a disturbance of liver-function, including in this the so-called urobilin-icterus. This is certainly a crude method of determining the presence or absence of disturbance of liver-function. We have, however, no very practical method of doing this.] He **would absolutely exclude from the operation** those cases in which there is marked icterus or urobilin-icterus, and those in which there is a tendency to delirium, to hemorrhages into the mucous membranes or elsewhere, or to other signs indicating marked disturbance of the function of the liver.

SYPHILIS.

H. Quinke¹ reports 4 interesting cases of **sypilitic disease of the abdominal lymph-glands.** In the first case disease in the glands of the mesentery had caused compression in the duodenum, and also complete stenosis at the pylorus or in the duodenum. Antisyphilitic treatment produced marked improvement, but 6 years afterward the condition recurred and ran a fatal course. In the second case there was cirrhosis of the liver with a large gummatous growth in the retroperitoneal glands, which during life had given rise to the thought of carcinoma. In the third case a **gummatous scar about the gallduct** and the head of the pancreas had given rise to signs of gallstone disease. Laparotomy demonstrated the nature of the condition, but it was impossible to correct it surgically. The symptoms had all improved under antisyphilitic treatment. In the fourth case there were conditions similar to those in that last mentioned, the patient having shown gradually increasing icterus; and later, ascites and edema of the legs. The symptoms gradually improved under the use of iodids.

J. A. W. Pereira² reports a case of ascites in a man of 25 years, in which there was reason to believe that alcoholic cirrhosis was not present. Iodid of potassium was given, and the man rapidly recovered from his ascites. He has since (over a year and a half) remained well.

ABSCCESS.

P. W. Bassett-Smith³ reports 5 cases of abscess of the liver, 3 of which were operated upon. He insists upon the value of **systematic examinations of the blood** for the presence of a leukocytosis, which he states to be a constant and important sign. He strongly recommends operation with open incision. He notes that after operation in one case there was seen

¹ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 1 u. 2.

² Lancet, Jan. 2, 1904.

³ Brit. Med. Jour., Sept. 19, 1903.

basic pneumonia of the right lung, and the leukocyte-count reached 80,000. After the abscess had been opened and vent had been given to the pus, the leukocytosis rapidly decreased. [Leukocytosis is, in the experience of a number of good observers, a very unreliable sign of abscess of the liver.]

FLOATING LIVER.

E. Meyer¹ reports a case of **floating liver in a man**, which is interesting chiefly because this condition is so rarely observed in the male sex.

DISEASES OF THE BILE-PASSAGES.

C. A. Herter² discusses the **etiology and the chemic pathology of gallstones**, reporting a series of observations concerning chemic changes in the bile and their relation to the production of gallstones. He thinks that **excessive cholesterin-production** is the chief factor in producing cholesterin-concretions. He reports some experiments made by Wakeman, which consisted in injecting strong solutions of bichlorid of mercury, carbolic acid, ricin, abrin, and diphtheria toxin into the gallbladder of dogs that had fasted for several days. When the animals were killed, a few days later, there was thickening of the gallbladder, with proliferation and desquamation of epithelium; and, in the bichlorid, carbolic acid, and ricin cases, the cholesterin was increased. In the abrin and diphtheria-toxin series there was absence of any noteworthy structural change in the mucous membrane, and the cholesterin was not increased. This indicates that inflammatory conditions of the gallbladder may lead to an increase in the cholesterin of the bile, and a series of cholesterin-estimations in human bile from more than 60 autopsies showed a relatively high percentage in nephritis, due to some imperfectly understood cause. An acute lobar pneumonia also showed a very high percentage of cholesterin. The **amount of calcium in the bile** and in the blood of the same animal and the amount of calcium in human blood in pathologic conditions were studied, without any striking result, except to indicate that a high percentage of calcium is not a prerequisite for pigmented stone-production, though an excessive concentration of the calcium of the bile may be responsible for the deposition of calcium salts. The inorganic salts of calcium are, however, of much less consequence than is the organic compound termed bilirubin-calcium. Experimentally in the test-tube the reaction of the bile is important in favoring precipitation, but it is questionable whether this factor is of importance in human pathology. The **amount of proteids present**, also, may be important in causing precipitation from the bile, but this factor has not yet been satisfactorily studied. The **influence of foreign bodies** in causing the development of gallstones is considered, and it is decided that they are comparatively unimportant, except that they tend to facilitate a reinfection of the gallbladder or to cause existing infection to persist. Cultures made from

¹ Berl. klin. Woch., Apr. 18, 1904. ² Med. News, Sept. 19 and 26, 1903.

the bile of 6 normal ducts by Rittger were negative. After discussing the most important work that has been done by others concerning the production of gallstones, the author decides that while there is no unequivocal evidence that **gallstones arise from constitutional derangement** unconnected with microorganismal invasions of the gallbladder, it must be recognized that such a thing is possible.

C. A. Ewald,¹ in a discussion of diseases of the gallbladder and bile-ducts, states that he has seen **but 2 cases of gallstone disease without colic** during the last 10 years. He thinks that the colic is always caused by contractions. He particularly refers to the importance of distinguishing between gallbladder disease and acute or chronic pancreatic disease. Only about one-fourth the cases of gallbladder disease have jaundice when stone or tumor is absent, and these are certainly absent in as much as 25 % to 30 % of all cases. Tumor of the gallbladder is much more frequently absent than present. The author considers aspiration of the gallbladder a very dangerous procedure. As to the **relation of gallbladder disease to surgery**, he states that the condition is comparable to appendicitis; that we cannot properly operate upon every case; and that the results of operation on the gallbladder are much more serious than are those of operation for appendicitis. During the acute stage and during colic he uses palliative measures unless there is a severe acute infection, when he advises immediate operation. Patients who have rapidly recurring favorable attacks he prefers to treat by medicinal means, as the stones in such cases are probably small and able to pass readily. In unfavorable cases **with recurrent attacks he advises operation**. If he thinks that stones are present, but remain either in the gallbladder or in the cystic duct, he favors operation, but allows the patient some latitude of choice. He thinks that patients with obstructive jaundice can, if circumstances make it wise, **wait much longer than 5 weeks for operation**. He believes that careful preventive measures against recurrence should always be used, whether or not operation has been undertaken. He particularly notes that operation may be complicated with or followed by many unfortunate results.

F. Kahn² has made a study of various drugs with reference to their influence as **disinfectants of the bile-passages**, a question that he considers to be worthy of more attention than it has received. Naphthol and formaldehyd preparations cannot be given so that they will reach the bile-passages in sufficient amount to be of value. The same is true of thymol and menthol, although these act even in small amount. His studies of **salicylic preparations**, however, have shown that these may be found in the bile-passages in sufficient amount to have a decided influence upon bacterial growth. Ichthyol is unsatisfactory.

¹ Amer. Med., July 18, 1903.

² Zeit. f. klin. Med., Bd. liii, Riegel Festschrift.

DISEASES OF THE PANCREAS.

P. J. Cammidge¹ discusses the chemistry of the urine in diseases of the pancreas, with particular reference to some observations that he has made concerning the **diagnosis of pancreatic lesions**. His object was to test for glycerin in the urine, converting the glycerin into a glycerose by heating with nitric acid and then testing with phenylhydrazin. He describes 2 reactions and also a separate preliminary treatment of the urine with perchlorid of mercury. The latter, he thinks, is useful in distinguishing between various forms of pancreatic disease. He considers the test to be important in diagnosis, and believes that by this means, in conjunction with careful observation of the clinical course and the symptoms, one may, as a rule, arrive at a correct diagnosis as to the existence of pancreatic disease and as to the nature of that disease. The essential details are so numerous that they must be sought in the original.

DISEASES OF THE KIDNEYS.

METHODS OF EXAMINATION.

B. Hallauer² makes an interesting brief communication concerning the **influence of concentration of the urine upon reactions for albumin**. He finds that if normal human urine be concentrated upon the water-bath and serum be added to it, the boiling test will still be strongly positive; while Heller's test and the acetic-acid-potassium-ferrocyanid reaction will be **absolutely negative, unless the urine be diluted**, when these tests will immediately give positive results. Also, if the concentrated urine be boiled after adding nitric acid, the result will be negative unless it be diluted, when it will immediately become positive. If the urine be very greatly concentrated, the boiling test will be entirely negative. The acetic-acid-potassium-ferrocyanid test fails most readily with concentrated urine; Heller's test is more irregular; while the boiling test is the most satisfactory. It was found that Heller's test is interfered with by the concentration of the urea; the boiling test, by urea and neutral salts; and the ferrocyanid test, by certain salts—particularly the phosphates. The importance of these results in demonstrating the doubtfulness of the reactions for albumin in concentrated urine is evident.

Bondi³ describes a simple method of carrying out Ehrlich's **diazo-reaction**, making the test with paper. The ammonia and sulfanilic acid are made up in the usual concentration, while the sodium-nitrite solution is diluted 10 times. One moistens a piece of filter-paper with a little urine, adds a little ammonia to the same spot, dips the end of a glass rod into the sodium nitrite, and then allows a drop of sulfanilic acid to flow down the glass rod and mix with the sodium nitrite. One next touches this to the filter-paper at about the border of the spot previously moist-

¹ Lancet, Mar. 19, 1904.

² Münch. med. Woch., Sept. 8, 1903.

³ Zent. f. inn. Med., Mar. 12, 1904.

ened with urine and ammonia. The reaction is said to be easily carried out in this way.

Pelzl¹ has studied the **diazo-reaction in over 500 cases**, usually making repeated tests in each case. He has found it regularly in typhoid fever, from the beginning of the first to the end of the third week. In measles it is present before the appearance of the eruption and in the earlier stages of the exanthem. It is also found in the angina of scarlatina, in advanced phthisis, and in septicemia. Except in typhoid fever and in measles it seems to appear chiefly in conditions due to streptococcic infection.

Tripold and Abbazia² have made a study as to the **influence of various factors upon the excretion of urine**. They insist upon the necessity for **noting the amount of fluid taken**, in order to draw proper conclusions. There are noteworthy relations between the **temperature and the humidity**, on the one hand, and the excretion of urine, on the other. The amount of urine increases with marked humidity of the atmosphere, and decreases with the contrary condition. If the humidity is slight and the temperature is low, the low temperature controls the conditions and causes increased excretion of urine. If the temperature is moderate and the humidity high, the latter factor is the more important. **A sudden abstinence from alcoholic drinks**, when the latter have been habitually used, and replacing them with water, causes marked diuresis. Natural carbonic-acid waters produce marked diuresis also. There are likewise marked **periodic variations**, from day to day, in the excretion of urine, even when the same quantity of fluid has been taken. Certain emotions, such as sorrow, may decrease the excretion of urine.

R. von Jaksch³ contributes a further extensive study of the relative amounts of the **different nitrogenous substances in the urine**, using Pfaundler's method for amidoacids. The conclusion reached is that in most cases the nitrogenous elements of the urine are excreted as urea and as other known substances, new and previously unstudied nitrogen-containing bodies not being excreted in the cases examined in any considerable amounts. Von Jaksch finds that from 95 % to 98 % of the nitrogen not precipitated by phosphotungstic acid is urea-nitrogen; 5 % to 8 % of that precipitated by phosphotungstic acid is due to purin-bodies and ammonia; and 83 % to 95 % of the total nitrogen of the urine is urea, only 1.5 % to 3.6 % of the total nitrogen being due to amidoacids. For clinical purposes, he states, it is entirely correct to determine the total nitrogen of the urine, multiply this by 2, and consider the product urea. The amidoacids may be somewhat increased by changes in the diet; for instance, by taking foods producing a large amount of benzoic acid. The only cases in which any considerable increase in the amidoacids was found were those of disease of the liver, typhoid fever, diabetes mellitus, and some of Basedow's disease.

¹ Wien. klin. Woch., 1903, No. 31.

² Zeit. f. diätet. u. physikal. Therap., Bd. vii, Hefte 1 u. 2.

³ Zeit. f. klin. Med., Bd. l, Hefte 3 u. 4.

PHOSPHATURIA.

A. Freudenberg¹ discusses the conditions of the urine observed in so-called phosphaturia, and particularly the ammoniacal reaction of the urine in this condition. He notes that in phosphaturia, when there is a spontaneous deposition of phosphates, the urine always shows ammoniacal reaction, and yet that in typical uncomplicated phosphaturia bacteria are absent. He thinks that the ammoniacal reaction of the urine is **due to some metabolic disturbance**, and not to bacterial change. He also refers to the condition that causes a marked precipitation of phosphates, which, he thinks, is due to the driving-off of carbonic acid. This condition he calls latent phosphaturia. He believes that it is a slighter grade of the same condition as manifest phosphaturia. In this condition, also, he finds that the reaction of the urine is alkaline, as the result of the **presence of an excess of ammonia**; and slightly heating the urine will drive off the vapor of ammonia. A still slighter degree of the same condition is that in which the urine is passed clear and remains clear upon boiling. It may even be acid; yet when it is boiled, one finds that the vapor of ammonia is given off. All these conditions are found in normal persons when a diet providing much alkali has been used, when there has been intellectual strain, when alkaline waters or drugs have been taken, and sometimes when there is no discoverable cause; but, besides these exceptional cases, one frequently finds these conditions in patients who exhibit evidences of neurasthenia. Freudenberg thinks that they have some **diagnostic importance in indicating the presence of neurasthenia**. The change from the manifest to the latent form he considers an evidence of improvement in health; and the contrary, an indication of an increase in the neurasthenic condition. Such conclusions, however, can be drawn only when diet, drugs, etc., have remained unchanged. Freudenberg has made no investigations to determine whether the ammonia is actually present in excess or there is merely a chemic condition of the urine that allows the ammonia to be more readily driven off. He thinks that, instead of using the name phosphaturia, it would be better to speak of **ammonuria with manifest phosphaturia, with latent phosphaturia, or without phosphaturia**. [Chemically, Freudenberg's observations seem hard to support, but they are interesting and may have some importance.]

ABNORMAL PIGMENTATION OF THE URINE.

A. E. Garrod² presents an interesting discussion of **black urine**, referring to the history of the condition and to the clinical side of the question. He mentions the following **conditions in which urine that is black or becomes black** may be excreted: jaundice, especially when of long standing; hematuria; hemoglobinuria; hematurporphyrinuria; melanotic sarcoma; alkaptonuria; ochronosis; cases in which indican is present in abundance; some cases of phthisis (only after the urine has

¹ Deut. med. Woch., Sept. 17, 1903.

² Practitioner, Mar., 1904.

stood for a long time); some rare cases of undetermined nature; and after taking certain drugs and articles of food (including carboloria). In cases of pernicious anemia, owing to the presence of a large amount of urobilin, the urine may become dark-brown, but is rarely, if ever, black. In hematoporphyrinuria the variations in the depth of the color are less commonly due to the amount of hematoporphyrin present than to the other abnormal pigments that are apt to accompany the hematoporphyrin and have, as yet, been but little studied. Garrod mentions the tests to determine the nature of the disturbance present. He particularly refers to the fact that indicanuria sometimes is associated with practical blackness of the urine. He thinks that this condition has repeatedly been mistaken for true melanuria.

W. Osler¹ reports 2 cases of **ochronosis in subjects of alkaptonuria**. Previously to this report he has found only 7 instances in literature. His cases showed definitely the relation to alkaptonuria. They were recognized clinically, owing to the pigmentation of the sclerotics and the cartilages of the ear. One case also showed a remarkable ebony discoloration of the nose and cheeks. This is apparently the first instance in which the skin has been noted as involved. The pigmentation was known to have been present for 8 years. The patients were brothers. One died of cardiac trouble, but no autopsy was obtained.

L. Langstein and E. Meyer² have made a study of a case of alkaptonuria, and have reached the conclusion that this is an **anomaly of intermediary metabolism**. They state that their patient showed a considerable amount of uroleucic acid, besides the homogentisic. These aromatic dioxyacids come from the proteids of the food, and also, the authors believe, as the result of their observations, from the proteids of the organs. They think that the source is not only tyrosin, but some further aromatic complex. They insist that the homogentisic acid derived from the aromatic complex of the proteid is excreted much more rapidly than is the total nitrogen.

J. M. Cooper³ discusses **green urine**, and reports a case in which it was passed as the result of taking a patent medicine. He emphasizes the point that in most cases the occurrence of a blue or green discoloration of the urine is **due to the ingestion of some anilin dye**, particularly methylene-blue. In such cases one should always inquire whether medicine has been taken.

HEMOGLOBINURIA.

W. G. Thompson⁴ reports 2 cases of **paroxysmal hematuria** and gives an interesting discussion of the condition. His patients were both boys, one 17 and one 20 years of age. In both, exposure to cold brought on the attacks; and in both, the condition had begun very early in life (at 3 and 4 years of age, respectively), and had lasted throughout the

¹ Lancet, Jan. 2, 1904.

² Deut. Arch. f. klin. Med., Bd. lxxviii, Hefte 1 u. 2.

³ Jour. Am. Med. Assoc., Mar. 5, 1904.

⁴ Med. News, Oct. 3, 1903.

intervening time. There was in both cases a prominence of urticaria, edema, and local cyanosis; and there was probably hereditary syphilis in both. The first patient also showed intermittent hydrarthrosis. Thompson has **found 206 other cases recorded**. Only a small number of these have come from this continent, and most of this small number of patients were of foreign birth. This latter fact he is inclined to attribute to the greater frequency of hereditary syphilis among the poorer classes in northern Europe. The disease has developed as late as the twenty-first year and as early as the third. It usually lasts many years. The attacks may be associated with fever and with rapid pulse; chills are frequent; pain is often prominent; jaundice is a common symptom; slight albuminuria is usually present; and sometimes there are attacks of albuminuria without blood-pigment in the urine. Blood-corpuscles are usually few in number, if present at all. There is frequently a neurotic family history, and often various vasomotor neuroses are present. Muscular effort is a common exciting cause, but cold is the most frequent and the most striking. There is no autopsy-information as to the nature of the condition; but of the theories in regard to its causation, syphilis seems the most prominent. Thompson does not think that there is anything to support the renal theory of the origin of the condition. He believes that no theory except one that includes the **influence of the nervous system** is satisfactory, because the disorder is most probably a profound neurosis, chiefly affecting the vasomotor system. The only treatment that has actually produced satisfactory results is **antisypilitic medication**, and this is effective in only a small proportion of the cases.

E. Homberger¹ reports a case of **hemoglobinuria** in a boy of 10 years. The case was interesting because the hemoglobinuria occurred but once, **directly after a fall into cold water**. Homberger believes that cold may produce the condition by changing the osmotic pressure of the blood-serum and of the corpuscles. He has been able to show that this occurs in the test-tube, and he considers it to be through this physical change that the hemoglobinuria occurs. [The cause is hardly so simple as this; otherwise we should expect to find hemoglobinuria to be a common symptom in cases with a suddenly produced and marked subnormal temperature.]

H. A. B. Pearson² reports a case of hematuria in a woman of 40, in which repeated attacks had occurred for a year; and it was found that she had had several attacks during the previous 7 years. There was a marked family history of **hemorrhagic diathesis**, and Pearson believes that this was the cause of the hematuria.

ALBUMOSURIA.

F. P. Weber, R. Hutchison, and J. J. P. Bence-Jones proteid in the urine. The triple

¹ Zeit. f. klin. Med., Bd. lili; Riegel. Forts.

² Lancet, Jan. 9, 1904.

myeloma was found. A chemic study of the various organs was also made. No organ or tissue showed a proteid identical with that found in the urine, but **the vertebrae and the ends of the femur showed an extremely similar proteid**, the differences in chemic action being such as might readily have been due to the differences in the mediums in which it was present. No such proteid could be obtained from normal red bone-marrow. The authors believe that Magnus-Levy is wrong in his theory that it is derived from ingested proteids, because they could find none of it in other tissues; and because **marked changes in the diet had very little influence** upon its excretion in the urine.

R. C. Bruce, K. F. Lund, and P. P. Whitcombe¹ describe a case of myelopathic albumosuria, noting that **reactions were obtained from the bone-marrow**; and that these reactions suggested the presence of an albumose, or of a closely allied body, in the bone-marrow. The clinical points in the case were the occurrence of fractures on the left side only, and widespread disease of the marrow of the long bones without the involvement of the cranial bones. Prominences were absent from the bones, and it was noted that a firm union had taken place in one of the fractured bones, although this bone was the seat of malignant disease. The patient was a woman, most of the other cases having occurred in men.

I. H. Coriat² reports a case in which **Bence-Jones proteid was found in a pleuritic effusion**, the patient having polyneuritis, delirium, and being an alcoholic. He had marked tenderness of the ribs with pleural effusion. Large amounts of Bence-Jones proteid were found in the fluid. The urine was negative. There was no anemia. In discussing this substance, Coriat inclines to the view expressed by Singer that it is **derived from the hemoglobin of the blood-serum**, through the enzymotic action of the plasma-cells of the bone-marrow, in cases of myeloma. In his own case the Bence-Jones proteid was evidently not absorbed at all. He believes that it was a digestive product of the action of the leukocytes or bacteria upon the proteids in the effusion, and that it was probably derived from the serum-globulin.

ALBUMINURIA.

A. Calvo³ has made a study of the proteid substances in the urine in persons with renal disease and in normal persons. He decides that in every case in which albumin is present it is possible to precipitate out an albuminous body by properly diluting and adding a sufficient amount of acetic acid. The quantity of this albuminous body varies greatly. Sometimes, when the urine is very albuminous, the acetic-acid reaction is extremely slight. In most cases, Calvo finds, this body precipitated by acetic acid consists of **euglobulin or fibrinoglobulin**; and sometimes of serum-albumin or pseudoglobulin—the latter substances, in rare instances, producing most of the precipitate. In various forms of albuminuria (febrile, nephritic, etc.) the differences in the relative amounts of

¹ Lancet, Apr. 16, 1904.

² Am. Jour. Med. Sci., Oct., 1903.

³ Zeit. f. klin. Med., Bd. li, Hefte 5 u. 6.

serum-albumin were comparatively slight, but in febrile albuminuria, the globulin or fibrinoglobulin sometimes constituted by far the largest portion of the proteid present. In interstitial nephritis this was sometimes present only in traces. Pseudoglobulin was ordinarily present only in extremely small amount in febrile albuminuria, and in very large amount in chronic nephritis of severe degree. In some instances, it was observed, with the cure of the nephritis the pseudoglobulin disappeared from the urine. In every normal urine, commonly spoken of as nonalbuminous, one may, by dialysis, determine the presence of an albuminous body precipitable by acetic acid, and consisting chiefly of euglobulin and fibrinoglobulin.

F. Lommel¹ has made a series of observations on 587 young persons, some of them having been examined only once, but most having been under observation from 1 to 4 years. He notes that **111 of these persons showed positive reactions for albumin** in the urine. In 6 of the cases the albuminuria was intermittent. Lommel especially notes that repeated examinations of the same person's urine showed nearly 3 times as many instances of albuminuria as would have been discovered by single examinations. In many of the cases globulin was present; but in 2 or 3 instances in which he settled this point Lommel found albumin as well as globulin. In 6 cases the amount of albumin was very small. It was rarely over 1:1000. Usually there was no pathologic sediment, but sometimes, after prolonged centrifugation, there were found a very few hyaline casts, and occasionally fatty epithelial cells. In a number of instances Lommel found juvenile hypertrophy of the heart. Of 90 cases, the heart was found abnormal in 38. In 11 of these there was a resistant apex-impulse; in 9, a systolic murmur; and in the others, tachycardia or increase in the dulness to the left. It is noted, however, that nearly as large a proportion of those that did not have albuminuria showed cardiac abnormalities. In the vast majority of these cases the albuminuria could not be explained by excessive exercise or undue physical strain. The results of examinations made in the morning, before beginning work, were, in most cases, the same as those of examinations made in the evening. Probably a number of the cases were instances of orthostatic albuminuria, and 2 were definitely determined to be so. The cases did not occur solely, or even especially, during the years in which the greatest amount of physical development takes place. Lommel particularly insists upon the great **importance of the albuminuria of puberty** in relation with the diagnosis of chronic interstitial nephritis, and says that hypertrophy of the left heart and abnormal tension of the pulse cannot be considered to be iron-clad differential diagnosis. Prolonged observation and a series of examinations are essential. The amount of albumin (almost always less than 1:1000), the absence of epithelial cells and granular casts, the cyclic character of the albuminuria speak in favor of the diagnosis of albuminuria of puberty. An ophthalmoscopic examination is also of great value. It is noted that in the cases that he has reported

¹ Deut. Arch. f. klin. Med.,

that of puberty. He bases this view upon his long-continued observation of the cases, their continual good health, the frequent return of normal conditions of the urine and heart, and the absence of reasonable causes of nephritis. He believes that there is too much tendency, particularly among those following Senator, to give an evil prognosis in such conditions.

G. A. Sutherland¹ discusses the relation between **orthostatic albuminuria and movable kidney**, his observations having been made upon children. In all, he has seen 40 cases of orthostatic albuminuria in adolescence. Of these, 13 (37.5 %) showed movable kidney. In 10 of these cases abdominal pain was present. The patients' ages varied between 7 and 14 years, the average age being 10½ years. Sutherland believes that there is a definite relation between orthostatic albuminuria and movable kidney in a certain number of cases. He has seen more cases of movable kidney in children among his 40 patients with orthostatic albuminuria than among all the other patients examined at a children's hospital during his service of 15 years. He agrees with the view that **the albuminuria is due to vasomotor abnormalities**; and thinks that the vasomotor changes that cause an overloading of the kidneys with venous blood when an upright posture is assumed lead to a certain degree of mobility. He finds that in Graves' disease, in which cardiovascular disturbances are common, movable kidney is usually present when these vascular disturbances are well marked, and orthostatic albuminuria is not uncommon. He has not been successful in treating the albuminuria with **abdominal binders** intended to hold the kidney in position.

R. Edel² discusses cyclic albuminuria and its **relation to changes in the circulation**. He has studied it in normal persons and in those that had a tendency to cyclic albuminuria, giving them baths of various temperatures, and studying the effects of these upon the blood-pressure. He has also studied the effect of bicycling, mounting stairs, and other forms of exercise. He finds an increase in blood-pressure to be constant in normal persons; the absence of this increase indicates a disturbance in the general circulation. This absence of increase is observed in those with cyclic albuminuria. Edel believes that **disturbance in the general circulation** is the chief cause of the excretion of albumin. He has also produced an artificial disturbance of respiration and found that this caused albuminuria. He recommends that cases of cyclic albuminuria be not treated with strict confinement to bed and with similar measures, but that there be made systematic attempts to give such patients increasing amounts of exercise, in order to increase the efficiency of the circulation. He has already obtained good results from such measures, and he thinks that similar measures might be used with value, and perhaps with considerable success, in the treatment of nephritis.

O. Jacobson,³ in discussing orthotic albuminuria, says that the **con-**

¹ Am. Jour. Med. Sci., Aug., 1903.

² Deut. med. Woch., Sept. 3 and 10, 1903.

³ Berl. klin. Woch., Oct. 5, 1903

stant absence of albumin in the evening urine is the chief point in establishing a diagnosis of orthotic albuminuria; and that, at any rate, **a twenty-four-hours' rest in bed** will absolutely clear up the albuminuria. He thinks that a certain amount of **weariness or overstrain is necessary** for the production of the albuminuria, and that the latter comes to pass because of a changing secretory function of the epithelium of the renal tubules, **dependent upon nervous causes**. The differential diagnosis of the condition is made only by carefully observing the urine. It is to be remembered that in a nephritis that is healing similar conditions may be met, but that the albumin does not disappear with the same regularity in the evening or after a brief rest in bed. Jacobson believes that orthotic albuminuria and the albuminuria of puberty belong to the same class, and that both are dependent upon neurotic conditions. **These forms of albuminuria indicate that the patient is easily exhausted**. The actual amount of albumin present may be considerable. Its chief characteristic is the striking intermittency in its excretion.

A. R. Elliott¹ reports 2 cases of cyclic albuminuria, in one of which he determined that bodily activity, of itself, when the patient was lying flat in bed, had no influence upon the albuminuria; while the mere assuming of the upright posture, with almost no movement, produced marked albuminuria. It was also noted in this case that there was a **rise of temperature synchronous with the excretion of albumin**. Both cases showed a close relation to previous infectious disease. Except for the albuminuria, however, there was no indication of existing renal disease. Elliott refers to other observations that have demonstrated that cyclic albuminuria may be the direct sequel of an acute infectious nephritis—a fact of much value in considering the importance of the condition. He thinks that every case should be viewed as being **directly connected with genuine nephritis**.

H. R. Schroeder,² in discussing the **clinical importance of albuminuria**, reports some cases, and emphasizes his view that it cannot be determined whether the albuminuria is a premonition of further trouble until the patient has been under observation for some time. **Frequent recurrences of transient albuminuria** may be of serious import. Persistent or even cyclic albuminuria should cause anxiety, and indicate the advisability of further examination, extending over months, or even years. The mortality among persons with albuminuria, as indicated by the statistics of life-insurance companies, is extremely high.

W. H. Broadbent³ insists that there is **no such thing as physiologic or functional albuminuria**. In patients having the condition commonly so termed, he has frequently noted a neurotic family history. The patients themselves usually present marked **cardiovascular instability**, with great variations in the frequency and force of the pulse under slight stimuli. Besides, the impulse of the heart is usually forcible, and the apex-beat weak. The albuminuria is reduplicated when the patient lies down. Br

¹ Med. Rec., Dec. 12, 1903.

² Brit. Med. Jour., Jan.

nosis in such cases to be favorable. He has never seen true postural albuminuria resist treatment or develop into chronic nephritis.

S. West¹ discusses physiologic or functional albuminuria, first insisting that the condition had better be called **albuminuria in the apparently healthy**. Among other facts, he refers to the **influence of age upon the prognosis in albuminuria**, this being seen very commonly in young children, quite commonly in older children, and extremely commonly in boys and young adolescents. These boys are either florid and of full habit, or pale and with low arterial tension. Albuminuria is least common between the ages of 20 and 25 years. After this it increases; and subsequently to this period it is of much graver prognosis.

C. Posner² reports a case in which **for 17 years there had been albuminuria, but no casts**, although some cylindroids were present. This, he believes, was not a chronic nephritis. He thinks that it must be classed as an essential albuminuria. The patient was a neurasthenic, and had been treated chiefly for neurasthenia.

I. H. Coriat³ refers to the cases of **emulsion-albuminuria** reported by Cramer, and himself adds a fourth case, which occurred in a man of 47 that had alcoholic delirium with an acute parenchymatous nephritis. The patient died November 1. On October 30 he passed milky urine, which resembled that seen in chyluria; but fat was absent, as shown by a number of tests, and the milkiness entirely cleared up upon complete coagulation of the proteid present. These cases are apparently instances of a form of albuminuria in which the proteid is present, not in simple solution, but **in a colloidal state**. It is probably analogous to the crystalline globulin and the crystalline albumose that have been found in the urine, and Coriat thinks that the proteid resembles the colloidal solutions of silver, platinum, etc.

NEPHRITIS.

C. Thorell,⁴ after an extensive consideration of the **pathologic and anatomic changes in the healing process in nephritis**, together with considerable experimental work on this question, reaches the conclusion that in nephritis cure does not, as is usually believed, occur after the cessation of the action of all processes that damage the cells, but that the **production of new cells is constantly going on** during the disease, and even during the course of progressive chronic parenchymatous or contracting nephritis. In spite of the continuous action of damaging processes, there may constantly be observed conditions that may be looked upon as tending toward healing. The most marked among these are karyokinetic figures in various cells.

F. Erben,⁵ in some investigations concerning nephritis, finds that in cases of chronic disease the **albumin of the blood is reduced; while**

¹ Lancet, Jan. 16, 1904. ² Zeit. f. klin. Med., Bd. liii; Riegel Festschrift.

³ Med. Rec., Nov. 14, 1903.

⁴ Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 1 to 4.

⁵ Zeit. f. klin. Med., Bd. l, Hefte 5 u. 6.

the globulin is distinctly increased. He thinks that the substance that is diffusible with the greater difficulty (globulin) is substituted by the organism for the more readily diffusible substance (albumin). It is worthy of note that he found an increase in the extractive substances. In chronic parenchymatous nephritis he found the same increase in globulin and decrease in albumin, and the same decrease in extractives. In secondary contracted kidney with amyloid degeneration he found a marked decrease in the albumin and some decrease in the globulin. The extractives were decreased in the erythrocytes and increased in the serum. In discussing the cause of nephritic hypertrophy of the heart he dismisses excessive viscosity of the blood as the direct cause, and also retention of extractives. The latter are increased at the time of uremia, but not at other times, as has been clearly shown by Strauss. Erben believes that his observations concerning the increase in the globulin and the decrease in the albumin of the blood constitute an indication of the **cause of the nephritic hypertrophy of the heart**; that is, he thinks that the albumin becomes reduced, and that **the tissues experience an albumin-hunger**. As far as possible this is overcome by vasomotor influences, which cause a more rapid circulation of the blood. This regulation, however, is usually insufficient; and in order to meet the tissue demands, the heart works harder and, consequently, hypertrophies. Erben therefore attributes the increase in blood-pressure and the hypertrophy of the heart to albumin-hunger. Other conditions, such as increased viscosity, the retention of extractives, the production of toxic substances in the kidney, etc., may also be considered to have some influence, but he thinks that they should not occupy the main place. They are chiefly the cause of uremia. [An immediate difficulty with such a theory is that the albumin of the blood is decreased in many other conditions, and yet cardiac hypertrophy and increased vascular tension do not occur in by any means all these conditions; so that mere albumin-hunger of the tissues does not seem to be a good explanation.] Erben also discusses the nature of the globulin of the urine. There are various reasons for thinking that this may be a different substance from the globulin of the blood-serum, and that it may be a pathologic product of the inflamed kidney. He finds, however, that when isolated from the urine and injected into rabbits, it causes the rabbits' serum to give a reaction with human blood. The globulin of the urine in nephritis is, therefore,—in part, at least,—normal serum-globulin.

J. R. Bradford,¹ in discussing Bright's disease from the clinical standpoint, **makes a distinction between Bright's disease and simple nephritis**. In his view, dropsy affords a sharp point of distinction between these two conditions. He divides nephritis into transitory, embolic, and toxic. Bright's disease is characterized chiefly by the occurrence of dropsy. It is divided into acute and chronic. Bradford particularly insists that **some cases are chronic from the begin** and have no association with a previous attack of acute Bright's d He recognizes two forms of chronic Bright's disease, one corres

¹ Lancet, July 4, 1903.

with the condition called large white kidney, being associated with dropsy at some period, and usually ending from pericarditis, pneumonia, or as a result of anasarca. In the second type of chronic Bright's disease the kidneys are contracted and the capsule thickened. The disease usually occurs in young persons, often less than 25 years of age. It is not associated with dropsy and there is frequently no history of a primary illness to explain the condition. Uremia usually causes death in this type. This second form has given rise to some discussion, and Bradford thinks it to be distinct from true granular kidney—particularly on account of the period of life in which it develops. He also thinks that there is no good evidence that it is necessarily a sequel of the ordinary type of Bright's disease. In this type, also, the patient usually excretes a large quantity of dilute urine, which contains some albumin. The chief clinical symptom is likely to be progressive loss of strength and flesh. Sometimes there is marked pigmentation. The sole symptoms may be headache and impairment of vision, or the condition may merely resemble chlorosis. It is very common in young women. Bradford distinguishes the renal complication of the secondary stage of syphilis from ordinary nephritis. There is usually a large amount of albumin present in this, but dropsy may be entirely absent. One of the striking points is that notwithstanding the marked albuminuria and its long duration, the condition may entirely clear up. He believes that nephritis is, as a rule, **dependent upon toxic or infectious conditions**, and not upon exposure to cold and such factors. In nephritis, he thinks, the toxic agent acts upon the renal element; but in Bright's disease it acts upon the kidney-tissues and upon the vessels of the body in general. In discussing the diagnosis he especially refers to the necessity, in various instances, of excluding epilepsy, tumor of the brain, chlorosis, neurasthenia, and various skin-diseases when rashes occur. He thinks it doubtful whether chronic Bright's disease is ever fatal from uremia when albuminuric retention is absent. [We feel constantly more impressed with the fact that a very noteworthy proportion of cases diagnosed neurasthenia, and also those called hysteria, have, upon careful examination, signs of kidney lesion.]

J. H. Musser,¹ in a general discussion of **abdominal pain**, insists upon the importance of uremia in the production of such pain, and refers to interesting cases in which uremia has closely simulated gastric ulcer, and to another case in which the presence of a hernia made it appear that the pain was due to the hernia. He also insists upon the importance of ridding one's self of the idea that abdominal pain is frequently hysteric.

A. Lion² discusses the condition of the **tendon-reflexes in nephritis**. He has himself studied 16 cases of chronic parenchymatous nephritis and 8 of contracted kidney. He has also gone over the records of 262 cases of nephritis observed in von Leube's clinic. Of the latter cases, in 5 only was it definitely stated that the knee-jerks were weak. In 3 of these there was edema, which would have tended to make the knee-jerks somewhat weak. In 3 cases of uremia it was noted that the reflexes were

¹ Amer. Med., Mar. 26, 1904.

² Zeit. f. klin. Med., Bd. 1, Hefte 3 u. 4

greatly excited. In his own cases Lion found, in 14 of parenchymatous nephritis out of 16, that there was **excitation of the reflexes**. In 3 of the 8 cases of contracted kidney the knee-jerks were not excited. He believes that the more closely a patient approaches uremia, the more actively will the knee-jerks be excited; and he thinks that in most cases of nephritis the knee-jerks are distinctly excited. That this occurs when there are no distinct evidences of uremia indicates, he believes, that practically all the symptoms in nephritis are due to a certain degree of uremia. When the knee-jerks are not excited in parenchymatous nephritis, Lion thinks that this is chiefly due to the presence of edema. In cases with evidences of renal disease he believes that **excitation of the tendon-reflexes indicates disease of some gravity**. With increasing excitation, there is, he thinks, an increase in the gravity of the patient's condition. If the knee-jerks decrease in activity, he considers it a favorable prognostic sign.

W. M. Stevens¹ has made a study of the tendon-reflexes in uremia, and has satisfied himself that they are commonly excited, though not constantly so. Ankle-clonus, knee-clonus, and exaggerated wrist-jerk and elbow-jerk may also be present. He thinks that this point should be **of value in diagnosing uremic coma** from coma due to apoplexy and similar central nervous lesions, and also in the diagnosis of uremic convulsions from epilepsy; likewise in directing attention to the danger of uremia, when other premonitory symptoms are absent, and in suggesting the possibility of nephritis when the disease would not otherwise be suspected.

E. Nyrop² reports cases of **chronic nephritis in which erysipelas occurred**. In the first an entire cure of the nephritis was apparently observed; in the second the condition rapidly improved, although it was followed by the appearance of contracted kidney.

A. Treutlein³ has made a study of the **cause of the absence of casts** in certain cases of nephritis, with the view of determining whether this is always due to bacteria, or may be due to the presence of proteolytic ferments in the urine, and to their activity. He first insists upon the importance of the fact that casts may be absent when albuminuria and other signs of advanced nephritis are present. He was unable to determine that the presence of a pepsin-like ferment in the urine is sufficient to explain the absence of casts. Further, he could not demonstrate that the leukocytes, in cases of coincident cystitis or pyelitis, had destroyed the casts. The leukocytes from ordinary abscess-pus likewise had no such effect. The solution of the casts he considered to be **due to bacterial action** (*Bacterium coli*). He thinks that this may occur in the bladder or, more probably, in the pelvis of the kidney; or, perhaps, in the tubules themselves. Perhaps it is necessary to have the bacteria themselves present, as any ferment that they produce is not alone sufficient to cause the solution of the casts. [This question is of much interest practically. It is remarkable how rapidly casts will disappear from the urine if it is allowed to stand without an antiseptic in it.]

¹ Brit. Med. Jour., Jan. 16, 1904.

² Zent. f. inn. Med., Apr. 16

³ Münch. med. Woch., Sept. 1, 1903.

Elshnig¹ describes his **systematic examinations of 209 cases of nephritis** within a period of 5 years, in relation to eye-conditions. Ten cases were excluded on account of the fact that there was severe eye-disease not dependent upon the nephritis. Of the 199 remaining cases, Elshnig found normal conditions in 74 (37.5 %), arteriosclerosis or perivasculitis in 16, atypical slight albuminuric retinitis in 24, characteristic typical albuminuric retinitis in 13, albuminuric retinochoroiditis in 6, other pathologic conditions (such as atrophy of the retina following retinitis, retinitis proliferans, thrombosis of the veins, etc.) in 7. An increase in the retinitis is of very unfavorable prognosis as to life. Elshnig insists upon the frequency with which **retinochoroiditis is associated with an immediately grave prognosis**. All 6 patients that showed this condition died within 6 weeks. He does not consider the ocular changes as absolutely characteristic of nephritis, but they occur with such frequency in connection therewith as to become of great importance.

C. W. Edmunds² contributes an extensive series of observations upon the **quantity of the urine passed during the day and during the night** in cases of cardiac and renal diseases and in others. He thinks that this method of clinical observation has not received the attention that it deserves. As the result of his studies he confirms the views of others as to the nocturnal polyuria that occurs in cardiac and renal disease; and as to the value of this fact as a diagnostic sign, particularly in cardiac disease. He also suggests that in many instances it may be possible to **trace the course of cardiac and renal disease** by observing the changes in the relative amounts of day and night urine. These observations should be carried out at intervals for short periods of time. Edmunds also thinks, from his observations, which are not yet complete, that drugs that produce diuresis when administered during the day tend to restore the normal ratio.

J. H. Abram,³ in discussing chronic interstitial nephritis, speaks of the great importance of **frequent micturition as an early sign of chronic nephritis**. He always considers a case of apparent acute nephritis in a patient over 40 years of age very suspicious and probably dependent upon chronic trouble. He does not believe that heart-disease is a cause of granular kidney. If a slight albuminuria occurs in a young person, it is possible that it may not be associated with organic lesions; but in a person over 40, it **practically always means kidney mischief**. Urohema-tinuria has, by some writers, been stated to be a more constant sign of kidney disease than is albuminuria. Abram has seen it in many cases of chronic renal disease, but only once in the absence of albumin; and in at least 2 cases he has seen it when there was no evidence of renal disease. Of 27 cases of chronic interstitial nephritis seen within a year, he notes that there was one in a person of 36 and another in a person of 32 years.

M. Krotoszyner and W. P. Willard,⁴ in a discussion of the newer

¹ Zent. f. inn. Med., Jan. 16, 1904, p. 70. ² N. Y. Med. Jour., Feb. 6, 1904.

³ Liverpool Medico-Chir. Jour., Jan., 1904. ⁴ Am. Jour. Med. Sci., May, 1904.

methods of **diagnosing unilateral lesions of the kidney**, state, among other points, that they consider that the real value of cryoscopy lies in the comparison of the urine obtained from the two ureters; and that when there is a very marked difference between the two sides, one kidney is almost certainly diseased. The phloridzin-test is also considered of value, but almost solely in the same way, the urine obtained by **catheterizing the ureters** of the two sides being compared. They believe that failures of the phloridzin-test are due almost entirely to the use of an unsatisfactory sample of phloridzin, particularly old solutions.

A. R. Elliott¹ discusses **chronic nephritis without albuminuria**. He believes that the characteristics of contracted kidney are the reduction of the solids of the urine and the presence of hyaline casts. The changes in the circulatory apparatus, chiefly cardiac hypertrophy and increased blood-pressure, are very important.

E. Wolze,² in discussing the **abnormalities of hemolysis in uremic conditions**, refers to a case in which he thinks the possible practical importance of studies of hemolysis was demonstrated. This was in a patient of 23 years who was admitted to the wards of the hospital with polyarticular rheumatism, which left behind it an endocarditis. Some years later the patient was readmitted to the clinic with the history of having suddenly become unconscious. Convulsions also occurred, and there were vomiting and some fever. There was no edema, but the urine contained albumin, blood, and sugar. There were also many red cells, granular and blood casts, renal epithelium, and many cylindroids to be seen under the microscope. The patient was at once bled, and the symptoms rapidly improved. The albumin and the casts disappeared, but the urine remained scanty for a long time. The diagnosis of the immediate attack was renal infarct with consequent uremia and with nephrogenous glycosuria. The investigation of hemolysis in this case showed that in the unaltered serum hemolysis occurred only after the addition of 0.7 cc. to 1 cc. of fresh serum, even after as long as 24 hours. When the serum was inactivated, 0.5 cc. of this was added to 1 cc. of a suspension of rabbits' corpuscles; this mixture was then reactivated with fresh rabbits' serum; hemolysis occurred completely after 30 minutes. Two days after the uremic symptoms had passed off the conditions of hemolysis were normal. Wolze has investigated a large series of other cases, including severe disease of the blood, and has never found a similar condition. In spite of the striking abnormality of hemolysis, agglutination of the red corpuscles was readily observed.

H. Senator,³ discussing the hemolytic activity of the blood-serum in uremia, refers to the observations of Neisser and Döring, and states that while it is sometimes present, he has found it absent in uremia. It is, therefore, **not a distinctive sign** of this condition. The subject is of such importance, however, that it needs further study.

¹ Med. News, Sept. 19, 1903.

² Zent. f. inn. Med., July 4, 1903.

³ Berl. klin. Woch., Feb. 22, 1904.

MOVABLE KIDNEY.

M. L. Harris¹ discusses the influence of **trauma in the production of movable kidney**. He refers to the fact that he has analyzed 1300 cases of railroad injury within 2 years. Of 728 males, none presented movable kidney. Of the 572 cases in females, there were 41 movable kidneys; but after a careful analysis of these cases, Harris has reached the conclusion that it is not at all certain that any case was due to the injury, and that, indeed, this is not even probable. He thinks that in some instances the injury drew the patients' attention to the movable kidney, through making some symptoms manifest. He believes that movable kidney **occurs in women with a particular body-form**, and that it is nearly always present in women that have this conformation. It is a condition that develops gradually. A sudden injury may displace a normal kidney; but such violent displacement is accompanied with a laceration of the perirenal tissues, and this is manifested by distinct local and general symptoms. Severe injuries involving the kidney or the perirenal tissues are seldom—and perhaps never—followed by movable kidney, and movable kidney is never the immediate result of a single trauma.

W. Sinkler² gives a general discussion of the **nervous phenomena associated with movable kidney**, referring to the fact that when the displacement is but slight, one often finds the reflex symptoms particularly marked. The patients may complain of pain in the region of the kidney, varying greatly in degree; and also of neuralgiform pains in various parts of the body. They may have irritable bladder, dysmenorrhea, pains about the liver and gallbladder, general dyspeptic symptoms, and mucous colitis; and appendicitis and pancreatic diabetes may in some instances be due to this condition. The most common nervous disorder in neurasthenia. There may be hysteric symptoms also. Sinkler does not believe that palliative treatment is likely to be very successful in this condition.

RENAL CALCULUS.

E. Apolant³ reports the case of an old man who was subject to the excretion of urinary gravel. He suddenly had an attack of anuria, which was thought to be due to the plugging of one ureter with a calculus, together with reflex spasm of the other ureter. An attempt was made to catheterize the patient, but this was unsuccessful, and there was **complete anuria for a week**, when there were signs of beginning uremia. Catheterization was again undertaken, this time successfully. It caused the escape of a considerable amount of blood and a free flow of urine, followed by normal conditions of the urine. The free excretion of somewhat watery feces had apparently protected the organism from grave

¹ Jour. Am. Med. Assoc., Feb. 13, 1904.

² Jour. Am. Med. Assoc., Feb. 13, 1904.

³ Deut. med. Woch., 1903, No. 29.

intoxication. A similar anuria had occurred in this case previously, and had lasted for 9 days.

R. E. Weegall¹ reports the case of a woman of 23, attacked with the symptoms of renal calculus and violent symptoms afterward, who was operated upon and found to have torsion of the pedicle of the kidney, the organ being "**absolutely gangrenous.**" It was removed, and the patient recovered entirely.

TREATMENT OF DISEASES OF THE KIDNEYS.

L. Mohr and C. Dapper² contribute an extensive investigation of **metabolism in nephritis**, with the particular view of determining the influence of large amounts of fluid upon nitrogen metabolism, upon the excretion of solids, and upon the albuminuria and other evidences of disease of the kidneys. A **moderate restriction of the amount of water** taken (down to 1.5 liters) often results in securing a better relation between the amount of water consumed and the amount excreted than does free water-drinking; and, by restricting the amount of water, it is, in such cases, possible to aid the disappearance of edema. The generally favorable influence of the restriction of fluid is quite as noticeable in kidney cases as in heart cases. In both acute nephritis and chronic contracted kidney a moderate restriction in the use of water (about 1500 cc., not reckoning in this the amount contained in the solid food) does not have any noteworthy effect upon the elimination of nitrogenous substances or of phosphoric acid. A decidedly more marked restriction than this interferes with the proper excretion of these substances. If cardiac weakness or edema leads one to restrict the water taken to a marked degree, it is advisable to introduce an **occasional day of free water-drinking**, in order to wash out any material that may not have been excreted. This flushing, of course, will not occur if the kidneys are no longer capable of carrying it on. As a rule, albuminuria increases somewhat if the water is restricted in cases of chronic contracted kidney. The authors have, however, observed that after a considerable period of treatment the albuminuria again gradually sinks. The cases of so-called parenchymatous nephritis that are associated with marked edema have not, as yet, been sufficiently well studied to determine the influence of water-drinking upon them.

W. E. Bendix³ contributes a series of experiments concerning the **relation between the action of the kidneys and that of the skin**. He concludes that in normal persons it is impossible to cause any change in the molecular concentration of the blood-serum through excessive sweating; but that in cases of nephritis it is possible, by making the patient sweat freely, to cause the excessive molecular concentration of blood-serum to be reduced to a point approaching the normal. He also found that heterogeneous substances, such as iodine, which a

¹ Australasian Med. Gaz., Nov. 20, 1903.

² Zeit. f. klin. Med., Bd. I, Hefte 5 u. 6.

³ Deut. med. Woch., Feb. 11, 1904.

excreted in the urine, may be found in the sweat—sometimes in considerable amount. He believes, therefore, that he has demonstrated clearly that it is possible, in nephritic cases, to make the skin take up vicariously the action of the kidneys.

F. Widal and E. Javal¹ describe their results in treating a case of parenchymatous nephritis. During the course of the treatment they repeatedly **alternated the diet from one containing a considerable amount of chlorids to one containing a very small amount.** By this means they were able to obtain hydration or dehydration of the system, in accordance with a high or a low content of chlorids in the food. This confirmed their previous observations. They insist that salts are the most dangerous food-stuffs in many cases of parenchymatous nephritis, and that a chlorid-reduction is often the most important point in therapy. They believe that a fairly free diet, including bread, meat, sugar, potatoes, butter, and a number of other substances, may properly be used, if the foods are not salted.

P. Edel² contributes an extensive study of the **influence of various drugs, and also of baths, rest, and muscular exercise,** upon the course of chronic interstitial nephritis. The measures used were divided into two groups. The first **acted chiefly by dilating the vessels,** with or without increasing the heart-power. In this group were warm baths and CO₂ baths, rest in bed, amyl nitrite, and nitroglycerin. **In the second class the influence was chiefly upon the heart.** This class was represented largely by graduated exercise in hill- and mountain-climbing. Edel noted no especial difference between the action of warm baths and that of CO₂ baths. The favorable influence of these measures upon the albuminuria he attributes largely to their effect in dilating the blood-vessels. The mountain-climbing acts largely, however, by causing freer breathing and thus improving the circulation. He especially recommends the use of carefully regulated mountain-climbing in a climate that is not overstimulating.

K. Thinger³ has made a study of **theocin** as a diuretic, having given it, altogether, in 17 cases with edema from various causes. He decides that it is an important and active diuretic, and is much more effectual than others of its class. It produces an initial and marked increase in diuresis, which, however, rapidly decreases. Quite often the further administration of theocin, even after a pause, produces only moderate diuresis. In some cases, by properly varying the dose, the secretion of urine may be kept at a high point for a long time. The best results are obtained in disease of the heart, the vessels, and the kidneys. In dropsies from other causes it is less effectual. Its effect may sometimes be increased, when there is marked insufficiency of the circulation, by first administering digitalis. Thinger states that theocin may usually be administered without disturbing the digestion, if the method of its administration is properly modified, or if the drug is combined with other substances that control its unfavorable effects.

¹ Internat. Clinics, vol. I, 14th Series, 1904.

² Zeit. f. klin. Med., Bd. liii; Riegel Festschrift.

³ Münch. med. Woch., July 28, 1903.

Mosaner¹ has observed the influence of **diuretin** and of **agurin** upon the kidneys, and says that after the use of these one can often find a **great many hyaline casts**, and sometimes slight albuminuria. After the drugs have been stopped, the casts disappear within 24 hours. He did not find any more severe evidences of kidney-irritation, but thinks that these are sufficient to indicate the necessity for care in employing these remedies. [We have in several instances observed marked evidences of renal irritation after the use of theocin.]

Lagrain and Guiard² recommend, in treating the persistent headache that occurs in chronic nephritis, when other methods have failed, the use of **lumbar puncture**, which may be repeated every 2 to 4 weeks. In their use of this measure they have never seen unfavorable results.

D. C. McVail³ reports 2 cases of acute uremia in which lumbar puncture was performed and the **cannula was left in for a considerable length of time** (in the first case, three-quarters of an hour), about an ounce of fluid being withdrawn. In both instances the patient began to regain consciousness within about 4 hours, and rapidly recovered. One patient got entirely well and the other showed only a slight trace of albumin. McVail believes that the convulsions and the coma of acute albuminuria are due, in many, if not in all, instances to a **sudden increase in intracranial pressure**; and that this may be relieved by spinal puncture.

C. E. Skinner⁴ discusses the **dry hot-air** treatment of Bright's disease and recommends its use, referring at length to its influence upon the excretion through the kidney and upon respiration and circulation.

B. Reed⁵ has made some observations concerning the influence of **secondary static electric currents** in removing albumin and casts from the urine, especially in patients who have gastrointestinal disturbances. He believes that the results are very encouraging.

G. Klemperer,⁶ in discussing the **treatment of renal calculus**, insists that the most important point is to keep a free and constant flow of urine passing along the urinary passages. Consequently, the patients **should drink water freely**, and should take it at regular intervals during the day. About 2500 cc. should be consumed in at least 5 portions. From 1500 cc. to 2000 cc. of urine should be passed during the day. In discussing uric-acid calculi, Klemperer suggests that urochrome helps to hold the uric acid in solution; and that the darker the color of the urine, the more uric acid remains in solution. One cannot influence this pigment, however, and should direct diet toward the **control of the acid-producing elements**; since excessive acidity tends to precipitate uric acid. The patients should live largely on vegetables, and bicarbonate of soda should be given 5 times daily—preferably 3 or 4 hours after a meal, as at that time the urine is more likely to be acid. In **phosphatic calculi** a mixed diet is to be preferred, vegetables and fruit being eaten in only moderate quantities. Alkaline water should not be used, but the patients should drink plain water or water charged with carbonic acid.

¹ Wien. med. Woch., 1903, No. 27.

² Brit. Med. Jour., Oct. 24, 1903.

³ Amer. Med., Nov. 28, 1903.

⁴ Progrès méd., 1903, No. 44.

⁵ N. Y. Med. Jour., Nov. 5, 1903.

⁶ Therap. d. Gegenw., Sept., 1903.

Jaenicke¹ recommends a tea made of birch-leaves as a means of dissolving renal calculi. He describes at length a case in which he believes that by this means calculi were entirely dissolved.

INTESTINAL PARASITES.

GENERAL CONSIDERATIONS CONCERNING INTESTINAL PARASITES.

Garrison, Ransom, and Stevenson² have made a statistical study of the intestinal parasites in 500 male patients at the U. S. Government Hospital for the Insane, in order to determine the frequency of infection with intestinal parasites. They found them in 66 cases, 10 patients having double infection, and in one patient there being 3 forms of parasites. Hook-worms were present in 15 cases; whip-worms, in 54; seat-worms, in 4; Cochinchina worms, in 3; and eel-worms (*Ascaris lumbricoides*), in 2. Tapeworms, flukes, and coccidia were not found. There was no evidence of parasitic infection of the liver, stomach, or other organ. The greatest number of the infections were found in men who had been in service in the Philippines, 25 out of 59 such men having shown intestinal parasites; and men from the Philippine service showed more than twice as high a percentage of infection as any other group. The authors emphasize the danger to the public health from such infections in soldiers that have returned from the Philippines.

W. J. Calvert,³ in 136 autopsies performed in Manila, found *Ascaris lumbricoides* 29 times, *Ankylostoma duodenale* 10 times, *Trichocephalus dispar* 13 times, and *Tenia solium* once. Nearly 68 % of the infections were in children. The absence of many infections with *Tenia solium* is surprising, since 4 % of all hogs killed in Manila are found extensively infected with *cysticercus*.

E. Bloch⁴ discusses the occurrence of eosinophilia in those infected with intestinal parasites. In 2 Togo negroes he found many ankylostoma eggs in the stools, and in these cases the eosinophiles were, respectively, 40.1 % and 33.1 %. In the latter case there was also an infection with the *Filaria medinensis*. What the effect of the latter infection was, he cannot state; but he refers to the fact that a moderate eosinophilia has previously been observed in this condition. He says that ankylostoma-infection in negroes rarely causes marked anemia—a fact that is in direct contrast with the conditions frequently seen in whites. Apparently, also, there is a tendency for negroes with ankylostomiasis to exhibit marked eosinophilia, while in bothriocephalus-infection of the whites there is a tendency to severe anemia without eosinophilia. Bloch also reports a case of echinococcus of the liver (which had, however, undergone supuration), in which the blood showed 14.7 % of eosinophiles. In one

¹ Zent. f. inn. Med., Apr. 2, 1904.

² Hygienic Laboratory, Public Health and Marine Hosp. Service of the U. S., Bull. No. 13.

³ Boston M. and S. Jour., Oct. 29, 1903. ⁴ Deut. med. Woch., July 16, 1903

case of echinococcus of the spleen he found the eosinophiles normal. In the liver-case just mentioned operation was carried out, recovery occurred, and 4 weeks later the eosinophiles were normal. In a note Bloch states that in 2 cases of pulmonary and abdominal echinococcus eosinophilia was absent.

A. E. Boycott¹ notes some **differential leukocyte-counts in parasitic infections**. He first details 19 cases of oxyuris, in which the counts of the eosinophiles varied from 0.4 % to 13.7 %, 42 % of the cases showing more than 6 % of eosinophiles. He says, however, that a moderate eosinophilia readily appears in children, and that most of these patients were children. Nevertheless he thinks it possible that some of the cases of eosinophilia in children were actually due to some sort of worm-infection. He presents his counts in 10 cases of normal and, so far as could be determined, wormless children. The eosinophiles ran from none up to 5.4 %. He then describes blood-counts in cases of infection with *Tænia saginata*, *Tænia solium*, *Ascaris*, and *Bilharzia*. Three of the 6 cases of tapeworm showed from 6 % to 18 % of eosinophiles; but these cases were all in children. The 2 cases of *Ascaris* showed no eosinophilia. The case of *Bilharzia* showed, at different times, from 5.2 % to 47.6 %. The mast-cells were, in a number of instances, found quite high—particularly when the eosinophiles were high.

OXYURIS VERMICULARIS.

A. Heller² discusses *Oxyuris vermicularis*, and strongly opposes the prevalent view that this parasite has its sole seat in the lower bowel and may be gotten rid of by means of enemas. He states that the parasite spends its whole existence in one host. The eggs are introduced into the stomach. The embryo is probably set free in the same organ and betakes itself to the small intestine, where it develops to complete maturity. **Propagation probably goes on largely in the cecum** and in the vermiform appendix. Heller insists that the parasites have a **habit of collecting in the appendix**. He describes briefly the various characteristics of their propagation and development. The whole process of development takes, he thinks, about 5 weeks. **The opportunity to infect other persons is great**; since an enormous number of eggs are scattered about and may be readily transferred to food, etc., by the hands of those infected, even though such persons are fairly cleanly. The treatment advised is first calomel, then santonin or some other vermifuge, and next a purge. In order to free the large intestine of the parasite, Heller gives by enema, according to the age of the patient, from 1 to 3 liters of a 0.2 % to 0.5 % **solution of *sapo medicatus***, this being given in the knee-elbow position. Since some of the organisms are likely to remain in the appendix, it is well to repeat this treatment after about a week.

¹ Brit. Med. Jour., Nov. 14, 1903.

² Deut. Arch. f. klin. Med., Bd. lxxvii, Hefte 1 u. 2.

ASCARIS LUMBRICOIDES.

A. J. B. Duprey¹ states that in the West Indies one not infrequently has an opportunity to see, in adults as well as in children, more or less **severe toxic symptoms** due to the presence of roundworms in the intestine, and especially to their dying and putrefying in the bowel. The **result is sometimes fatal**. The condition is particularly common in children of from 2 to 10 years. Duprey describes a case in a boy of 8, who had convulsions and offensive bowel-movements. Purgation and washing the bowel caused some improvement; but the patient had persistent fever and very rapid pulse. After less than one week's illness he died. Postmortem examination showed many roundworms in the intestine, and the absence of any determinable disease other than this.

UNCINARIA.

J. M. Wainwright and H. J. Nichols² have made a **study of the stools of 400 anthracite miners**, in order to determine whether the hook-worm is present and has any relation to the anemia of miners in this country. They **found ova of the hook-worm but once**. Stiles considered that they belonged to the Old World variety. They also found once the larva of the *Strongyloides intestinalis* in a native of Russian Poland who had been in this country for but a few days. They found 15 instances of Ascaris infection, 24 of infection with *Trichuris trichiuria*, and 3 of Oxyuris. Evidently the hook-worm is not common in American miners. Nevertheless the danger of infection is great if opportunity for infection among coal-miners is once given, and it should be carefully guarded against. Wainwright and Nichols note that **practically all the mine-mules are infected with a parasite almost identical with the human hook-worm**, but apparently this cannot be transferred to human beings, and experiments in transferring it to guineapigs were negative.

A. J. Smith,³ in discussing **uncinariasis as observed in Texas**, refers to the fact that he encountered the first instance of this disease in that State in 1893, and that in several instances he found small ecchymotic wounds in the upper part of the small intestine. This discovery led him to suspect that the wounds had been caused by hook-worms, though the parasites were not found in these cases, possibly because in these instances a laboratory servant had washed the intestines before they came under Smith's observation. In 1901 he observed the first case of the disease, but the patient was a Mexican. The second case was seen the same year, the parasites being found in some specimens exhibited to the class, but the host of these parasites could not be discovered. A systematic examination, undertaken later in the same year, showed that **in 86 students there were 8 instances of infection with**

¹ Lancet, Dec. 12, 1903.

² Med. News, Apr. 23, 1904.

³ Am. Jour. Med. Sci., Nov., 1903.

Uncinaria americana, and several cases observed by others have also come to Smith's notice. The hosts in these cases came from various parts of Texas. The 8 cases that must have been infected in Texas are described in detail. Smith reviews the history of uncinariasis in the United States, and gives a description of the parasite and of its ova and embryos. For treating the condition, he recommends thymol. In order to discover the parasite the feces should be placed in a cheese-cloth pouch, above a filtration-bucket, and a moderately forcible, thin stream of water should be allowed to play upon this pouch. The possibility of infection through the habit of dirt-eating is referred to, and also that of infection through carrying hands soiled with dirt to the mouth, or through eating raw, unwashed vegetables. Smith suspects that **infection may sometimes occur through cistern-water**, even though the parasites and their ova must in such cases have remained submerged for a considerable length of time. He believes that the possibility of infection through the skin must be recognized as a distinct one. The earlier cases observed by him were apparently the first instances of infection with *Uncinaria americana* that have ever been reported. The parasites were identified by Stiles as the same as those described by him under this name.

E. D. Bondurant¹ insists emphatically upon the importance of the hook-worm in the South—particularly in Alabama, where his observations were made—in causing disease. He has himself diagnosed about 50 cases, almost all from Alabama, and he refers to a **large series of cases** that other observers have told him that they had discovered. He believes it to be one of the most prevalent and most serious diseases found among the poor whites in the South. He notes that in one case Parker found 953 worms expelled from the intestine, and in another case, 1700.

T. A. Claytor,² with E. E. Butterfield, has made a study of the **action of thymol in various forms in dogs**. He finds that the **alcoholic solution, even in small doses, is dangerous**, because it tends to produce inflammation of the lungs by aspiration. **When oil is added to this solution, the drug is dangerous** in doses of more than 4 grains with dogs of about 16 pounds weight, because it is irritant to the gastrointestinal mucous membrane. **In dry powder it may be given in large doses** without serious results. Large doses given hypodermatically cause only local inflammation. Claytor thinks that there is no danger in giving from 2 to 4 grains followed by 1 or 2 tablespoonfuls of brandy to an adult human being, if a purgative, such as castor oil or magnesium sulfate, be given within a few hours. He believes that an alcoholic solution obtained in this way would be efficacious.

In discussion, C. A. Smith stated that he had been able to locate cases of uncinariasis that were not otherwise suspected by getting **the history of the patient in regard to attacks of ground-itch**. Every one that had had ground-itch within 7 or 8 years was found to have uncinaria in his intestines.

C. W. Stiles said that **ground-itch may be found in persons who have**

¹ N. Y. Med. Jour., July 4, 1903. ² Jour. Am. Med. Assoc., Aug. 1, 1903.

no hook-worm disease. He did not think that infection through cotton can occur, but believed that infection through drinking-water is possible. It is not, however, so common as one might suppose, because the larva sink in water. Stiles thinks that the old genus *Uncinaria* will have to be subdivided. The parasites that have recurrent hooks in the mouth should be classed in the genus *Ankylostoma*. Those without buccal hooks, but with buccal lips, belong in the genus *Uncinaria*; but there are several subgenera, which may eventually be considered as genera.

A. J. Smith believed that the drinking of cistern-water from over-ground cisterns may readily become a cause of infection. He also noted the **apparent relation between this parasite and malaria**, in that recurrences of malaria in 6 or 8 cases took place persistently, quinin producing no permanent effect; but after the parasites had been removed from the intestine, quinin acted promptly and permanently. He thought that when malaria does not respond to quinin, one should carefully look for complication with uncinariasis.

B. K. Ashford and W. W. King¹ discuss **uncinariasis in Porto Rico**, stating that the climate, the water-soaked soil, the dense shade, the density of the population, agricultural life, bad sanitation, and the habits of the people are conducive to infection. They do not think that malaria is prevalent on the island, except on the coast. This largely **rules out malaria as the cause of the widespread anemia** seen there. The authors have in but one case found anemia due to uncinaria in a full-blooded negro, although negroes often harbor large numbers of the parasites. This is testimony against the view that the anemia is due to mere abstraction of blood. Other reasons that they offer for thinking that **the anemia is toxic** are the fact that the nervous symptoms are often out of all proportion to the anemia; that there is often a marked eosinophilia; and that the mental condition of the patient commonly changes for the better much sooner than the anemia begins to improve markedly. The authors also mention some work indicating that toxic substances are present in uncinariasis as they are in the analogous condition in bothriocephalus-infection. They do not think that the worm can suck a sufficient amount of blood to cause the anemia in many cases in which there are apparently but few worms present. They insist that the amount of hemoglobin and the degree of eosinophilia are both very important indications of the condition of the patient. They find that **leukocytosis is not common**, but that **eosinophilia is very common**, and occurs in practically all cases at some period of the disease. In those that have suffered for but a short time and have active blood-regeneration high eosinophilia is to be expected; in chronic cases in which there has been profound anemia for a long time the eosinophile-count is likely to be low. A rise in eosinophiles in such cases is of **good prognostic import**; a fall, accompanied with a lack of improvement in the physical signs, of bad import. A slow rise in eosinophiles often means a long convalescence. The eosinophiles usually return to normal when the patient is cured. The peculiar dirty, grayish-yellow pallor of the skin in the

¹ Amer. Med., Sept. 5, 1903.

Porto Ricans and the ashy pallor in persons of lighter complexion is a striking feature of the disease, and one that may lead one to suspect it upon first sight. Among the complications the authors note the **resemblance to peripheral neuritis**. In one case this diagnosis had been made by a previous observer. Earth-eating is uncommon in Porto Rico, and therefore is not probably a frequent cause of the disease there. They have not noticed that the stools contain an appreciable quantity of blood or have any characteristic brownish tinge.

Stockman¹ reports a case of **ankylostomiasis that occurred in Scotland**, which he believes to have been the first observed in that country. The man showed pronounced anemia; and, after discharging the worms and undergoing proper treatment, recovered entirely.

J. Nagel,² in discussing the treatment of ankylostomiasis, mentions the fact that he has frequently observed **decided evidences of poisoning with Filix mas**, consisting chiefly in headache, vertigo, rapidity of the pulse, and some rise in temperature. There were at times marked disturbances of vision and great prostration. Phenacetin or salipyrin is very useful in treating these symptoms. After trying various vermifuges for ankylostomiasis, Nagel has come to the conclusion that Filix mas is by all means the best, but it must be fresh—*i. e.*, prepared from plants gathered the preceding season. He notes a case in which about 3 drams of the extract of Filix mas given to a healthy man caused a sudden total amaurosis with rigidity of the pupils and progressive atrophy of the optic nerve. A similar case was soon afterward observed after the use of about 1½ drams of the drug and the repetition of this dose. Filmaron has recently been used by Nagel in a series of cases, with resulting cure, when both the extract of Filix mas and thymol had previously been employed unsuccessfully. The mixture in which it was given contained 7 parts of filmaron, 15 of chloroform, and 200 of castor oil. The dose of filmaron was about 7½ grains. This mixture was also used in conjunction with thymol.

TÆNIÆ.

C. W. Stiles³ discusses the **dwarf tapeworm, the Hymenolepis nana**. This worm is always less than 2 inches in length. It belongs to the Tænia family. It was first recognized as a parasite in the rat. The first case seen in this country was described in 1872. Since then a number of cases have been reported. In an examination of 2500 persons at the National Hygienic Laboratory the worm was discovered 16 times. Stiles believes that it is a more or less **common parasite in certain parts of this country**. The clinical disturbances are probably not so marked as those produced by the larger worms, but the dwarf tapeworm may cause distinct disorder of health. The worms themselves are likely to escape observation, on account of their diminutive size. A search for the eggs, however, will yield characteristic results. The treatment is male-fern.

¹ Brit. Med. Jour., July 25, 1903.

² Deut. med. Woch., July 30, 1903.

³ Maryland Med. Jour., Nov., 1903.

H. M. Hallock¹ describes 2 cases of *Tænia nana* in soldiers, both of whom had been in the Philippines. Both had digestive disturbance associated with diarrhea, and both had considerable abdominal pain. In looking for these parasites Hallock finds it to be most satisfactory to dilute the stools with a considerable amount of water, and then to run the mixture out in a thin layer on a large plate of glass that has a black background, and examine it with a large reading-glass. The worms now appear as very minute, translucent or opalescent shreds, but are very easily overlooked. The ova can be much more easily found with the microscope than can the worms themselves.

Dirksen² contributes a very interesting observation of **profound anemia** that he believes to have been **due to *Tænia solium***, the first case reported in which anemia has been believed to have been due to another tapeworm than the *Bothriocephalus*. The patient had 906,250 red cells, with normoblasts, poikilocytosis, and polychromatophilia. A vermifuge caused the discharge of 60 meters of *Tænia solium*, which was partly degenerated and macerated. After this there was rapid recovery from the anemia.

Jaquet³ has studied the usefulness of **filmaron**, a product of *Filix mas* that is perhaps the active principle of the latter. He finds that in doses of from 5 to 7 grains it has excellent and prompt action, without any unfavorable effects.

BOTHRIOCEPHALUS.

S. Isaac and von den Velden⁴ have determined that the **injection of bothriocephalus substance** into rabbits causes the **production of a precipitin**, and also state that the blood-serum of a patient with bothriocephalus-anemia reacted with a solution of autolyzed bothriocephalus, while normal blood-serum did not. They believe, therefore, that a specific precipitin is produced in the blood-serum of patients with bothriocephalus-anemia, and consider this as added evidence of the toxic nature of this anemia. [This work would have been more convincing if more control-work had been done.]

¹ Jour. Am. Med. Assoc., Apr. 2, 1904.

² Deut. med. Woch., 1903, No. 39.

³ Pharmaceut. Zeitung, 1903, No. 27.

⁴ Deut. med. Woch., June 30, 1904.

PEDIATRICS.

By J. P. CROZER GRIFFITH, M.D., AND J. CLAXTON GITTINGS, M.D.,
OF PHILADELPHIA.

GENERAL SUMMARY.

SINCE the last volume of the YEAR-BOOK appeared, pediatric literature, although containing much of interest, has offered but little striking or leading to entirely new results. Cytodiagnosis has continued to be a favorite subject for investigation, as applied especially to the blood and to the fluid of serous cavities. As always, too, infant-feeding has furnished a text for many contributions. Various new foods have been recommended; buttermilk has continued to have further evidence in its favor, but the difficulty in obtaining it in a sufficiently pure state has not been solved. The numerous articles upon the subject of feeding go to prove the recognition of the difficulties surrounding it. We are, as ever, convinced that in the majority of cases careful modification of cow's milk, suited to the individual case, will give the best results. Nevertheless, the continued studies of the ferments of human and of bovine milks show that differences exist which we have no means of overcoming.

In connection with infant-feeding the papers of Shaw and Schilling on the digestive power of the saliva are worthy of attention.

Typhoid fever has still been the object of the awakened interest of the last few years, and so valuable contributions have appeared. The relation of streptococci to scarlet fever has been much debated. We are in accord with those who believe that although these germs exert a powerful influence on the prognosis, through no development of complication and sequels, they yet possess no certain etiologic relation to the disease itself, so far as has been demonstrated. The value of antitoxin in diphtheria has been the subject of numerous articles, which have made no change in the generally accepted views. There appears to be nothing especially noteworthy relative to the other acute infectious diseases. The usual recommending of new remedies for pertussis is noticed.

The question of the relationship of the human and the bovine tubercle bacillus to each other and to infantile tuberculosis is one of the greatest interest to pediatricists. The work done on the subject is still self-contradictory; only further investigations can settle this vexed question with any degree of satisfaction. We would call especial attention to the paper of Ganghofner, as presenting clearly the present aspect of the case.

Some additional cases of stenosis of the pylorus have been reported.

and there have been some interesting contributions to the subject of the relationship of enterocolitis to the Shiga and allied bacilli. As yet no practical deductions can be made. There seems to be no one form of diarrheal disease in infants which is invariably associated with some one species of microorganism.

There have been a number of contributions to the physiology and pathology of the blood. Some of these will be immediately useful; others are in the line of knowledge in this division of medical science.

We note a useful article upon the status lymphaticus, which expresses fairly the view of this much-discussed subject that seems to us most worthy of acceptance. There are also a comprehensive discussion by Snow of the causes of death in the new-born, and a paper by Bloch upon marasmus and its relation to lesions in the intestine, in which he concludes that these are secondary in nature.

There have been a number of valuable contributions upon the subject of rickets. The cause of the disease is still not at all understood, and the views on treatment vary most widely. The paper by Siegert, however, upon the influence of heredity is extremely suggestive. The possibility that heredity may possess some etiologic influence has been, we think, too much ignored.

There have been some serviceable contributions upon cyclic albuminuria and upon interstitial nephritis. The dangers of gonococcal infections in children have been amply illustrated. The treatment of enuresis by epidural injections deserves attention.

Hysteria in children has received consideration, and cerebrospinal meningitis has been discussed by several writers. The successful use of antiseptic injections in connection with lumbar puncture will doubtless stimulate further efforts in this direction.

MILK AND INFANT-FEEDING.

The literature of the year contains several suggestions for **increasing the mammary secretion** of nursing women. Holger Prip¹ advocates the administration, twice a day, of **cow's udder** chopped and boiled for several hours. This substance is rich in nitrogen and fat, and may act as a food; or the udder may contain some ferment or secretory stimulant. No trials have been made with the powdered extract of the udder. H. Zlocisti² administers **lactagol**, a fine powder insoluble in water, produced by Pearson's method from cottonseed oil. From 1 to 2 ounces are given daily; larger doses are required in the later stages of lactation. The actual amount of milk secreted in 24 hours was not determined. N. P. Barnes³ claims good results from the use of full doses of powdered extract of **thyroid gland**.

The formed elements in colostrum and woman's milk give us valuable information concerning the quality of the secretion. E. Weill and V. Thevenet⁴ find that a large number of polynuclear cells in the centrifuge

¹ Hospital stidende, 1903, No. 28.

² Berl. klin. Woch., Feb. 1, 1904.

³ Med. News, Oct. 10, 1903.

⁴ Arch. de méd. des Enf., Aug., 1903.

gate indicates a good plentiful secretion of breast-milk. On the contrary, an **excess of lymphocytes** in the colostrum or milk gives a **poor prognosis** for successful lactation. A ratio of 25 lymphocytes to 100 polynuclear cells shows a deterioration in the secretion; this ratio may reach 80 to 100.

A. Filia¹ deems it impossible to judge of the value of mother's milk by the **examination of its ferments**; the principal cause of primary infantile dyspepsia lies in the infant's organism, more especially in the feeble activity of the proteolytic enzyme of the pancreas.

Adolph Würtz² believes that infants are often weaned too soon, when the enforcement of **long intervals between feedings**—4 to 5 hours—would have sufficed to keep up the maternal secretion without interfering with the mother's obligations. Würtz's own child thrived normally, although after the eighth week he was fed only 4 times a day, at 4- to 5-hour intervals; there were no night-feedings. The average quantities nursed at each meal were much higher than Feer's averages, which Würtz explains by the assumption that the gastric contents passed on into the duodenum during the act of nursing.

Alfred Hand, Jr.,³ is convinced that there are many mothers anxious to nurse their children, whom no amount of care will ever enable to do so; and he has seen many instances of undoubted injury to the child as a result of **breast-feeding injudiciously prolonged**. This does not in the least decry the value of breast-milk in the majority of cases.

Kerley, Gieschen, and Myers⁴ have investigated the **acidity of cow's milk and human milk**, and the effect of the addition of alkalis to cow's milk. They conclude that: (1) Human milk and cow's milk are both acid; (2) the litmus-paper test is unreliable; (3) the effect of adding lime-water or bicarbonate of soda to feedings is to retard or to inhibit the formation of curds by rennet, and the teaching that they are added merely as antacids is erroneous.

Luigi Concetti⁵ believes that we should try to preserve the **natural soluble ferments in milk**, since they are of distinct biologic value for the infant organism.

D. L. Edsall⁶ reviews briefly some of the recent investigations on the **biologic differences** between human milk and the milk of animals. He first refers to Heubner's experiments, which demonstrate that there is a marked loss of energy in digestion and absorption in bottle-fed babies which can be attributed only to the fact that the bottle-fed child is obliged to use this energy in changing the cow's milk so that it may become a suitable food for its tissues, while the nursing child is not obliged to do this. The essential difference between breast-feeding and artificial feeding is that in the former the infant gets human albumin, —i. e., albumin of the same species, or **homologous**,—while in the latter he receives bovine albumin, which comes from a different species and is **heterologous**. Wassermann's recent experiments have shown that

¹ Riv. di clin. Ped., 1903, p. 535.

² International Med. Mag., Aug., 1903.

³ Arch. de méd. des Enf., Aug., 1903.

⁴ Jahrb. f. Kinderheilk., 1903, lviii.

⁵ Med. Rec., Aug. 8, 1903.

⁶ Amer. Med., Sept. 26, 1903.

the intraperitoneal injection in guineapigs of heterologous proteid excites a demand for certain biologic ferments which are concentrated at the point of introduction; and these ferments assist in destroying bacteria which may be introduced into the peritoneal cavity. The injection of homologous proteid does not cause an excessive demand for ferments; hence the local immunity is not raised above the normal. Wassermann believes, therefore, that more is demanded of the child in assimilating heterologous proteid than in making use of its natural food. He fails to take into account, however, that the milk the child receives is digested before it reaches the circulation, and its effect cannot be compared with that of proteid injected intraperitoneally. The reaction of the child's organism to bovine albumin is often marked when weaning is being accomplished. Moro¹ has found that a single feeding of cow's milk given to a nursing child will cause the leukocytes to rise rapidly (once to 19,800) whether the milk be given whole or diluted one-third. It seems almost as if an **auto-immunization** of the infant's organism might be taking place when artificial feeding is started. The work of Moro indicates that the lesser resistance of the bottle-fed baby to infection depends upon the fact that it lacks certain protective substances which are provided in mother's milk. Moro has found that the blood-serum of nursing infants possesses much greater bactericidal power than the blood-serum of bottle-fed infants, and contains more alexins or complementary substances. These differences disappeared rapidly when the nursing baby was fed with cow's milk. Moro, Fokker, Hesse, Basenau, and others have shown that milk itself does not possess any noteworthy bactericidal properties; they are probably present in some combination and are set free only in the process of digestion or of assimilation. Moro has also demonstrated that the serum of the breast-fed infant has a much more marked hemolytic action than that of the artificially nourished child. His comparison has unfortunately been made with infants fed on sterilized milk. It seems probable that any protective property in cow's milk might be destroyed by heating the milk. It has also been found that human milk contains a **diastasic ferment** not found in cow's milk, which is apparently produced in the mammary gland. An important fact has also been demonstrated: that many milks contain a peculiar **oxidizing ferment**. This may be made use of in determining whether milk has been subjected to high temperatures. Many of these investigations seem to emphasize the dangers of sterilization and point to possible ill-effects from pasteurization, since most of these biologic properties are destroyed by heat, many of them even at pasteurizing temperature. An additional argument for the value of clean, uninfected milk is thus presented.

Von Behring² believes we should strive for **immune milk** to prevent the development of tuberculosis. Since heating milk for an hour at 60° C. injures the immune bodies in the milk, he ascribes the high mortality in bottle-fed infants to this procedure (pasteurization). Instead, he advocates the addition of formalin, 1:4000. [Pediatrists will scarcely admit the wisdom of this advice.]

¹ Arch. de méd. des Enf., July, 1903. ² Therap. d. Gegenw., 1904, Heft 1.

Henry L. K. Shaw,¹ in determining the quantity of fat in cow's milk, has compared the results by the use of several commercial methods with those obtained by the Adams' extraction method. The Babcock test showed an average error in 30 tests of only 0.07 %, and can therefore be considered most reliable. By the use of the Babcock formula we can easily calculate the total solids other than fat. This formula consists in dividing the specific gravity of the milk by 4 and adding to this one-fifth of the percentage of fat. The percentage of error is slight. As the sugar and salts in both woman's and cow's milk vary only in a small range, the amount of proteid can be approximately determined.

Henry Dwight Chapin² deduces certain principles from a comparative study of the nutritive requirements of infants and other young mammals. There are 3 stages in the development and nutrition of infants—(a) preplacental, (b) placental, (c) mammary. In all these the infant should be looked upon as attached to the mother. At the beginning of the mammary stage the infant's stomach is only rudimentary. As the digestive juices increase in quantity and strength the work of digestion is increased, as the stronger gastric juice produces tougher curds. Milk must be the basis of an infant's food, not alone because it contains animal proteid, but because it contains the only available form of proteid that possesses the function of developing the digestive tract. The milks of all animals will produce good tissue. Their proteids differ in accordance with the type of the digestive tract they are to develop. The proteid of cow's milk must therefore be modified or adapted to the infant's stomach. This may be done by chemically or mechanically altering the character of the curds. When a sufficient quantity of proteid cannot be given, it must be supplemented by other forms of nuclealbumins until the normal quantity can be digested.

Walter Freund³ discusses the relation between the water and salts in the infant's organism and the changes in body-weight on the basis of 8 metabolism experiments. Transient rapid increases in body-weight are largely due to absorption of water and occur under pathologic conditions, especially when bottle-fed infants are recovering from chronic disturbances of nutrition. This abnormal assimilation of water does not occur in breast-fed babies convalescing from enteric disease. We must consider it a good omen, a sign of beginning reparation. In the class of cases that gain very slowly and remain thin with relaxed muscles, it is probable that the body-fat is consumed and a relatively small amount of water absorbed; in the class that gain rapidly on artificial foods and recover quickly from enteric disorders it is likely that all the constituents of the body, including the fat, increase simultaneously with the large absorption of water.

Vanderpoel Adriance⁴ emphasizes the danger of deficient proteids in infant-feeding. Since proteids are essential for the development of muscle, their deficiency in the diet will be marked by flabbiness and loss of muscular tone. The lack of globulins needed for the formation of

¹ Arch. of Ped., Aug., 1903.

² Jahrb. f. Kinderheilk., 59, Apr., 1904.

³ Arch. of Ped., July, 1903.

⁴ Arch. of Ped., Aug., 1903.

hemoglobin leads to anemia. Children who have been starved of proteids are more prone to the diseases of infancy and more liable to succumb to them. Such starvation means retarded development—the child is slow to sit alone, to crawl, to walk. Fretfulness, delayed dentition, a tendency to perspire about the head, are symptoms of malnutrition and beginning rickets. Rickets is thus a chronic disease of nutrition—not purely a disease of the osseous system. The deficiency in salts which corresponds to that of proteids, especially of calcium and phosphorus, still further predisposes to rickets. The milk of prolonged lactation is deficient in proteids and salts. When lactation is about to cease, the proteids will be found low, whether at an early or a late date in the nursing period—unless the cessation is brought about by lack of use. In breast-fed infants Adriance has repeatedly seen **intestinal indigestion** which was due to a **deficiency of nitrogen** in the milk, and a change to modified milk with increased proteids has cured the condition. The diarrhea which results from deficient proteids is not watery, nor is it a febrile disturbance. It is preceded by a period of **lowered vitality**, and, as a rule, **anemia, peevishness, and stationary weight** give warning. It is often difficult to decide whether an excess or a deficiency of proteids is at fault. More care should therefore be directed to improving the mother's secretion of milk. In artificial feeding it must not be forgotten that the percentage of proteid in cow's milk is nearer 3.50 than 4.00, and that the higher the fat-percentage in cream, the lower the proteids. A 20 % cream contains only 3 % of proteids. [While the importance of underfeeding or of overfeeding of infants as a cause of digestive disturbances can hardly be overestimated, it seems to us that the explanation of failure to avert malnutrition will sometimes be found, not in the method of feeding, but in some defect in the digestive and assimilative powers of the individual infant.]

W. H. Park and L. E. Holt¹ report upon the **results of feeding** infants with **different kinds of pure and impure milk** in the tenement houses and institutions in New York city. Careful observations were made of 632 children during 1901 and 1902. Briefly, their conclusions were as follows: The results of feeding during hot weather with condensed milk and "store milk" were worse than with pure bottled milk or breast-milk; during cool weather the health of the infants was not appreciably affected by the kind of milk. Heating to 170° F. or over, as commonly practised, seemed to offset many of the disadvantages due to the large bacterial content of "store milk" unless this content was very high. Only the purest milk could be taken raw; infants digested heated milk more readily than raw milk. No especial variety of bacteria was found in milk that was of any marked importance in relation to summer diarrhea. Pasteurized milk which is more than 36 hours old is unsafe on account of the spore-bearing bacteria. After the first year infants are less and less affected by the bacteria in milk derived from healthy cows unless these are present in excessive numbers. As very poor people depend largely on "store milk," everything should be done

¹ From the Rockefeller Institute. Arch. of Ped., Dec., 1903.

by Health Boards to improve the general milk-supply. The method of furnishing milk in separate feeding-bottles from central distributing stations unquestionably possesses the advantages that it secures constant oversight of the child and affords the mother the smallest opportunity for harming the milk. Bad surroundings are not the chief factors contributing to bad results in feeding; intelligent care on the part of the mother can more than offset their disadvantages. All possible means should therefore be employed to educate the mothers. Exact percentage modification, while desirable in difficult cases, is not necessary with the great majority of infants; a certain adjustment of a healthy infant to its food is usually soon secured. The injurious effects of giving table food and fruit to infants under one year of age should be more generally appreciated.

From a series of investigations on **milk modifications** made from various milks and by different people, Edsall and Fife¹ conclude that milk modifications of medium strength under the best conditions will occasionally vary as much as 0.3 % from the prescribed formula. In low modifications the error will be less, and in high modifications correspondingly greater. Within these limits home modifications are trustworthy if they are made by clear-headed and careful persons from milks and creams of a chemie composition known to be reliable. If these conditions cannot be obtained, the modifications are likely to vary greatly from the formulas prescribed. Laboratory modifications appear to be satisfactorily accurate. Edsall and Fife's analyses demonstrate the importance of leaving nothing to the judgment or memory of the person making the modification. Instructions as to the method of preparation, amounts of the ingredients, etc., should be written out, or filled out on printed blanks, even to the smallest details.

Estimations of the **capacity to assimilate sugar** in childhood were made by Albert Greenfield.² Of the 33 cases investigated, 4 were under 2 years, the remainder from 2 to 13 years old. He found that the body-weight and condition of nutrition did not affect the power to assimilate sugar, nor did tuberculosis, syphilis, rickets, or anemia exert any influence. The child's limit of assimilation of sugar depends on its age, increasing gradually from infancy until toward the age of 10 years it reaches that of adults.

The **value of Soxhlet's Nährzucker** [nutrient sugar] in infant-feeding is further confirmed by Brüning,³ of Leipsic. This product is a soluble white powder, consisting of equal parts of maltose and dextrin, plus 2 % of sodium chlorid and a small percentage of acid lime-salts. It is faintly acid, contains no albumin, and is easy of absorption. Soxhlet advises its admixture with the child's food in watery solution of 10 % or at the most 20 % strength. For 3 ounces of the milk mixture use one or two teaspoonfuls, 160 grains, of Nährzucker. It may be given in acute and chronic digestive disturbances, and is adapted especially to those cases which do not tolerate large quantities of cream and milk in

¹ N. Y. Med. Jour., Jan. 16, 1904. ² Jahrb. f. Kinderheilk., 1903, lviii.

³ Berl. klin. Woch., Sept. 28, 1903.

their food. It has a constipating effect, but this seldom proves a disadvantage, nor does it require a change of diet. The results obtained by Soxhlet, Klautsch, Weissbein, Moro, Rommel, and Brüning were favorable. The majority of the 169 cases did well. These included healthy children, cases of acute and chronic enteritis, colitis, dyspepsia, and atrophy. In desperate cases gain in weight and improvement in nutrition often resulted for a short period.

The addition of sodium chlorid to the infant's food has a favorable influence on the weight, say P. Nobécourt and G. Vitry.¹ Small amounts, 4 to 5 grains a day, give the best results. The most marked influence is seen in premature infants and those with very low weight.

Rotch² calls attention to the **idiosyncrasies** for one or more of the **elements of milk** which are seen in certain infants during the first year of life. These infants require a great variety of percentages and combinations of percentages for their successful feeding.

Henri de Rothschild³ advocates the use of **acidulated fat-free milk** in the gastroenteritis of infants. To prepare this, fat-free milk is acidified by pure cultures of the lactic-acid ferment. From 30 cc. to 60 cc. of this milk were given at each feeding. Out of 14 apparently hopeless cases, 13 recovered.

The indications for **buttermilk** in infant-feeding, says H. Rensburg,⁴ are as follows: first, inability to digest casein, where the usual devices to render the casein more digestible have failed; second, inability to digest fat; third, inability to digest starches. The great advantage of buttermilk is the digestibility of its proteid (casein) content. Fat and starch may be added to it in any desired proportion to meet the needs of the individual case. The difficulty still remains that milk-dealers are not able or willing to furnish a pure product suitable for infant-feeding.

Reinach⁵ treated 18 acute and 26 chronic cases of gastrointestinal disease with **whey**, with unsatisfactory results for the most part. The signs of difficult casein digestion (alkaline stools, paracasein curds giving Millon's reaction) were not altered by a whey diet in most cases. Whey gives the best results in the treatment of acute digestive disturbances, where there are vomiting, great restlessness, and very acid stools containing large amounts of fat.

H. L. K. Shaw⁶ finds, from 100 tests, that the **saliva of infants** under 2 months of age contains a **diastasic enzyme** capable of converting small amounts of starch into maltose, and that this action may continue in the stomach as long as 2 hours after feeding. Zweifel's statement that the submaxillary gland does not secrete saliva before the end of the second month is disproved by F. Schilling,⁷ who finds **saliva from the submaxillary** present in infants ranging in age from **9 days to 6 weeks**. The absolute prohibition of starch in any form during the first two months of life does not therefore seem justified.

¹ Rev. mens. des Mal. de l'Enf., Mar., 1904.

² Jour. Am. Med. Assoc., Aug. 15, 1903.

³ Le Progrès méd., Oct. 24, 1903.

⁴ Jahrb. f. Kinderheilk., 1904, lix.

⁵ Albany Med. Annals, Jan., 1904.

⁶ Jahrb. f. Kinderheilk., 1904, lix.

⁷ Jahrb. f. Kinderheilk., 1903, lviii.

The 3 best exponents of well-being in children, according to Freeman,¹ are a **healthy complexion, a clean tongue, and well-digested bowel-movements**. Such children, he believes, are much less liable to those most prevalent disorders, bronchopneumonia and gastroenteritis. In order to secure the best results in children, after their first year, one must control their **feeding, rest, exercise, and exposure to fresh air**. Milk should still be the basis of the diet during the second year. In addition, there should be given cereal gruels, clear meat soups, eggs, orange-juice, and, toward the end, bread and butter and scraped meat. Every child during the second year should take a morning and afternoon nap, in addition to 12 hours' sleep at night. The value of sufficient exercise is sometimes overlooked among the children of the wealthy, whose parents systematically neglect to enforce it. Many cases of constipation are caused by this. The lack of sufficient fresh air is more frequently seen, and its results are even more harmful.

Three distinct attacks of **acute urticaria** with alarming collapse were observed by J. R. Clemens² in a child of 14 months following the ingestion of **white of egg** in some form. At a later date the child was noticed to be limping and the feet were found to be extremely swollen, with purpuric spots, petechias, and ecchymoses extending up as high as the middle of the legs. This attack followed the ingestion of gingerbread made with eggs. [Compare Bendix's reported case in YEAR-BOOK, 1904, p. 245.]

T. S. Westcott³ presents a card device by which calculation of percentages with 16 % cream and whole milk can be made in a few moments.

INFECTIOUS DISEASES.

N. Filatow⁴ discusses the diagnosis of certain febrile diseases of childhood. He considers that the 3 cardinal symptoms of **typhoid fever** are: (1) **Fever**, in its characteristic form; (2) **recent tumor of the spleen**; (3) **rose-spots**. A regular pulse, usually retarded in comparison with the temperature, speaks for typhoid fever; the pulse of meningitis usually becomes irregular as well as slow. The typhoidal form of tubercular meningitis of Rilliet and Barthez may be indistinguishable from true typhoid during the early stages. In the absence of a pronounced tumor of the spleen, despite high fever, violent delirium, cough, and decidedly pronounced evidences of infection, the diagnosis of typhoid must be made cautiously and acute tuberculosis must be looked for. Against typhoid and for tuberculosis are: a particular paleness with a cyanotic hue of the face and, according to Boucher, hyperesthesia of the chest. It is also important to remember that, despite the negative results of the physical examination of the chest, when the patient is suffering from dyspnea and annoying dry cough, miliary tuberculosis may be suspected. Filatow has also observed protracted cases of **la grippe** which closely resembled **latent tuberculosis**, from which they differed by their epidemic character and favorable termination.

¹ Arch. of Ped., June, 1904.

² N. Y. Med. Jour., Jan. 6, 1904.

³ Med. News, Apr. 16, 1904.

⁴ Clin. Rev., Mar., 1904.

A. Baginsky¹ contributes a very complete article on **typhoid fever** in children. He draws attention to the frequency of the **abortive form** in childhood, in which the diazo- and Widal reactions are positive. The greater frequency of relapses in children he considers to be well proved. Adynamic conditions dependent on the heart are less to be feared in early life than in adults, although they do occur and are particularly dangerous in those children who continually refuse to take nourishment. The intolerance of the child with typhoid for cold baths is also pointed out.

C. P. Sylvester² reports a case of typhoid fever in an infant 6 months of age in which a positive **Widal reaction** was not obtained until the **eighteenth day** of the disease. The case might have passed as one of meningitis had not the reaction been persistently sought for.

Samuel S. Adams³ presents a summary of **337 cases of typhoid fever** in children treated in the Children's Hospital, District of Columbia, since 1872. Most of the patients were over 5 years of age and the clinical picture presented was, in the main, typical of the disease as seen in adults. J. P. Crozer Griffith⁴ considers that this applies more accurately to later childhood—from 9 to 12 years; in the first 2 years the disease is liable to be atypic in most particulars, while from 3 to 8 years it shows the usual symptoms greatly modified. In this latter period the onset is more apt to be slow and insidious than in the adult; "walking typhoid" is far more common, epistaxis and tympanites are less frequent, and nervous symptoms are more prominent. As a rule, the duration of the attack is proportionately shorter in younger children. Complications are more rare in childhood than in adult life, and the prognosis is more favorable. The employment of hydrotherapy in childhood as a routine method is inadvisable. Children bear high temperatures readily, and many of them are intolerant of the cool bath or even of cool sponging. Careful judgment in the individual case must be exercised.

John Lovett Morse⁵ continues his investigations on typhoid fever. The following are his conclusions in regard to **fetal and congenital typhoid**: (1) The typhoid bacillus can traverse the abnormal, and possibly the normal, placenta from mother to fetus. (2) The resulting infection is from the first a general septicemia. For this reason, and probably also because the intestines are not functioning, the classic symptoms of extrauterine typhoid are wanting. (3) The fetus usually dies *in utero* or at birth. (4) It may be born alive, but death usually occurs in a few days without definite symptoms. (5) If it lives longer, classic symptoms of typhoid may appear, and some of its pathologic lesions may be found at death. Death is the usual result; certain imperfectly reported cases suggest that recovery may take place. (6) It is possible that the fetus may pass through the infection *in utero* and be born alive and well. There is, however, no proof that this happens. Judging from the number of reported cases, it appears that typhoid occurs less frequently in infants than in adults. Except for the lessened exposure in the first year

¹ Boston M. and S. Jour., Dec. 31, 1903, and Jan. 7, 1904.

² Boston M. and S. Jour., Mar. 24, 1904.

⁴ Med. News, Sept. 26, 1903.

³ Arch. of Ped., Feb., 1904.

⁵ Med. News, Aug. 1, 1903.

through food, Morse can find no apparent reason for this. Analysis of reported cases showing a positive Widal reaction or positive culture of the typhoid bacillus shows that the type of infantile typhoid, as regards its symptomatology, is essentially the same as in adult life. It is possible, however, that milder cases have escaped notice, and that this conclusion is therefore erroneous. The Widal test in a large series of cases not clinically typhoid, and bacteriologic examinations in large series of autopsies, offer the best means of solving this problem. The results so far obtained by these methods are unimportant and inconclusive.

Ludvig Hektoen¹ reports one case and cites two other examples of the double infection of **scarlatina** and **typhoid fever**. On account of the presence of typhoid bacilli in the blood in the early stages of this disease proper cultural methods make possible an early diagnosis in such cases of double infection.

Hasenkopf and Salge² have studied the phenomenon of **agglutination in scarlet fever** to determine by biologic methods whether the streptococcus of scarlatina plays a specific primary rôle or is simply the carrier of a secondary infection. They found that the *Streptococcus scarlatinae* was agglutinated by the serum of patients with scarlet fever, but that this property of the serum was lost toward the end of convalescence. Most of the other varieties of streptococci were not agglutinated by scarlatinal serum. The *Streptococcus scarlatinae* was not agglutinated by the blood-serum of healthy individuals nor by various serums taken from patients suffering from other diseases due to streptococci. The writers do not believe that the streptococci found in scarlatina are the cause of the disease, but emphasize the fact that these streptococci stand in close biologic relation to the scarlatinal patient.

Dopter³ finds that the serum of patients suffering from scarlatina can agglutinate the streptococci not only of that disease, but also of septicemia, erysipelas, etc., and vice versa. He therefore rejects the specificity of the *Streptococcus scarlatinae*. Jochman,⁴ too, does not believe that its specific relation as an etiologic factor in the disease has been demonstrated, although it must play a very important rôle. As a result of his anatomic, bacteriologic, and hematologic studies he finds that most fatal cases of scarlatina in children dying during the course of the disease succumb to a general streptococcus infection. He could demonstrate streptococci in the circulation in about half of his cases before death, and in nearly all after death. The latter might be explained as agonal infections.

J. H. McCollom and J. B. Blake⁵ report 2 cases of **peritonitis**, occurring late in the course of **scarlatina** due to a streptococcus and independent of any local exciting cause. The peritoneal involvement was apparently only a part of a widely distributed general infection involving

¹ Med. News, Sept. 26, 1903.

² Jahrb. f. Kinderheilk., lix.

³ Soc. de Biol., May 14, 1904.

⁴ Deut. Arch. f. klin. Med., vol. lxxviii, ii, 3 and 4.

⁵ Boston M. and S. Jour., Dec. 10, 1903.

other serous cavities as well as excretory organs, organs of special sense, and a part of the circulatory system. S. N. Cherepin¹ saw a severe case of scarlatina complicated by aphasia with paresis of the right arm and leg, lasting 7 days. Consciousness was fully maintained. A second attack of scarlatina within 8 months, in a child of 3 years, was observed by W. A. Dunkel.²

Antistreptococcal serum is of distinct value, according to F. P. Mackie,³ in those cases of scarlatina in which the lesion of the throat is severe and toxemia is marked. His judgment is based on a study of 950 cases. If no effect on the temperature follows the first or second injection, the administration should be suspended.

J. Widowitz⁴ has used **urotropin** in 102 cases of scarlatina, to prevent **nephritis**, with uniformly good results. While his experience is not conclusive, it is undoubtedly suggestive.

H. E. J. Biss⁵ contributes an interesting article in which the difficulties in the diagnosis of **borderland cases of scarlatina and diphtheria** are well illustrated. In our attempts to classify accurately every case he thinks we become liable to grave error. The practical results of this can be seen in the outbreaks of diphtheria in a scarlet fever ward and vice versa, from a case which, on hard-and-fast lines, has been consigned to one or the other classification. Only the most careful study and wide experience will enable the observer to recognize those cases in which a definite diagnosis is an impossibility and thus to avoid the error of attempting to make it. From numerous illustrative cases he infers that no different characteristics of these morbid conditions, scarlatina, diphtheria, and tonsillitis, are mutually exclusive, and that, though these nosologic terms may be employed for the sake of convenience, it must be remembered that they do not represent absolute entities. (See Fig. 1.)

Raoul Labbé⁶ draws these conclusions from **cryoscopy** in the course of **scarlatina and diphtheria**. During the milk régime insufficiency (in the cryoscopic meaning) occurs rarely, that is, the value $\frac{\Delta}{\delta}$ is low. When this value $\frac{\Delta}{\delta}$ rises and insufficiency shows itself, it may result—(1) from a sudden complication, or (2) from a sudden diminution of diuresis. During the period of soft diet insufficiency may show itself as a result of change of diet, especially in weak children, but is not constant. When meat is given, the value $\frac{\Delta}{\delta}$ always rises. Cryoscopic insufficiency may disappear in a few days, but usually varies from day to day before disappearance. It generally vanishes in six months to one year after the disease. The value of prolonged milk diet in convalescence is emphasized.

The fact that during **epidemics of diphtheria** there is usually an increase in the prevalence of **simple sore throats** has been recognized for many years. We now know that many of these cases of sore throat without visible membrane are due to the presence of the Klebs-Löffler bacillus in an otherwise insusceptible person. If the bacillus lacks viru-

¹ Prakt. Vrach., 1903, No. 34.

² Lancet, Feb. 20, 1904.

³ Lancet, Nov. 7, 1903.

⁴ Arch. of Ped., Jan., 1904.

⁵ Wien. klin. Woch., Oct. 1, 1903.

⁶ Arch. de méd. des Enf., May, 1904.

lence, the spread of the disease is not aided by such persons. If the bacillus possesses virulence to a greater or less extent, such a person becomes a distinct menace. Thomas W. Salmon¹ thinks that a name should be given to this class of cases which would indicate to the lay mind its contagious nature, and at the same time distinguish it from those in which the tangible evidences of the disease and its serious character are well recognized by the laity. For the present he is inclined to accept the term "**catarrhal diphtheria**" as opposed to **membranous diphtheria**. The diagnosis of catarrhal diphtheria depends entirely upon bacteriologic examination. As cultures can be sent

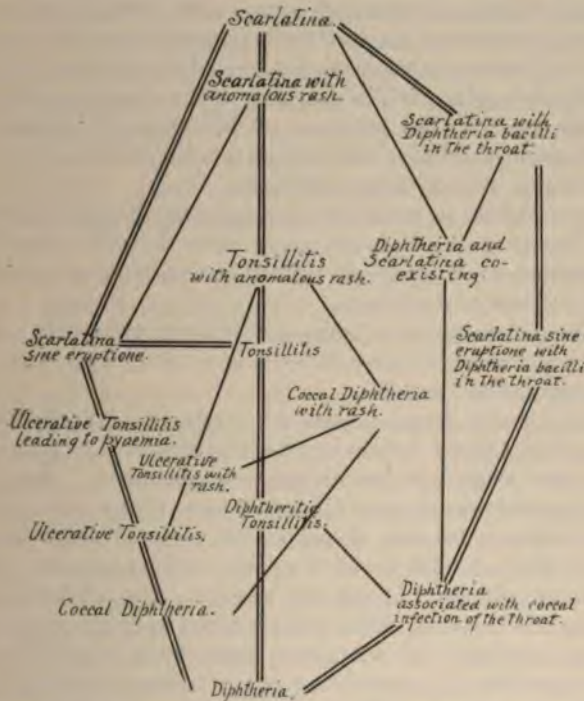


Fig. 1.—Plan of relations of scarlet fever with other infections (Biss, in *Lancet*, Nov. 7, 1903).

by mail which require about 3 days in transit, without hindering the successful growth of the bacilli, there is nothing to prevent even the remote country practitioner from availing himself of the privilege of some city laboratory. The management of these cases requires the same sanitary regulations that apply to true diphtheria.

E. S. Stokes² reports an outbreak of diphtheria and "sore throat" in which the contagion was clearly traced to the milk of one of the residents on the farm of this dairyman were found to have pathogenic Klebs-Löffler bacilli in their throats, although

¹ *Med. News*, Nov. 21, 1903.

² *Australasian Med.*

symptoms of the disease were manifest. The epidemic subsided at once after the removal of these infected persons and thorough disinfection of the premises.

Marfan,¹ from the study of over 2000 cases of diphtheria in the Hôpital des Enfants Malades in the past 2 years, finds that there is much less discrepancy between the **clinical and bacteriologic diagnoses** than is sometimes asserted; this discrepancy being often due to error. He does not believe in a simple catarrhal diphtheria or "diphtheria without membrane," although his arguments against it do not appear conclusive. He found that 80 % of his cases of follicular tonsillitis accompanied by laryngeal symptoms were true diphtheria; whereas less than 0.5 % of follicular cases without laryngeal symptoms were found to be diphtheria. In diphtheria the exudate tends to spread over the tonsil rapidly; if such a spread does not occur within 24 to 48 hours, a negative diagnosis can safely be made. White patching of the throat in young children is usually diphtheric; the presence of laryngeal or nasal symptoms should lead to a positive diagnosis even when the throat is not suspicious. In case of doubt, always inject antitoxin.

C. B. Ker² thinks it would be of advantage if hospital statistics of diphtheria discriminated between those cases in which there is merely a positive bacteriologic report and those in which the clinical symptoms are in reality those of diphtheria.

M. A. Veeder³ employs a **gauze shield**, in **examining diphtheric throats**, which covers the face below the level of the eyes, and is retained by tapes around the head.

In discussing the diagnosis and management of **doubtful cases of diphtheria**, F. F. Caiger⁴ insists on the importance of examining **smears made from the swab** with which cultures are made. He finds that a large percentage of cases can be diagnosed thus with a minimum of delay. While the Hoffman bacillus seems to be well differentiated from the forms of true Klebs-Löffler bacilli, it appears to be a possible predisposing factor in the development of the true disease. Impetiginous excoriation of the skin at the outlet of the nostrils is often found in nasal diphtheria, although the presence of membrane frequently cannot be detected. In deciding the difficult question as to when it is safe to allow an infected "contact" or a convalescent from diphtheria to mix with the community, Caiger considers the presence of local inflammation in the throat the most important factor in prolonging detention. He is convinced of the value of local antiseptic treatment both during the disease and after, until the throat is free from bacilli. He prefers a solution made by adding 5 minims of strong HCl to 9 grains of chlorate of potash and shaking up with one ounce of water. This may be diluted one-half during the acute stage. The presence of adenoids appears to be often responsible for the persistence of the diphtheria bacilli. During the period of isolation as much time as possible should be spent in the open air.

¹ Gaz. des Hôp., Mar. 14, 1903.

³ Med. Rec., Oct. 30, 1903.

² Practitioner, Oct., 1903.

⁴ Lancet, Dec. 26, 1903.

In 11 out of 63 cases of **ordinary coryza** L. Ballin¹ found **diphtheria bacilli** present in the nasal secretion. He considers their presence due to **accidental contamination**, just as we find diphtheria bacilli in the throats of healthy persons exposed to diphtheria. These cases are not entirely without danger, and the presence of diphtheria bacilli may signify that diphtheria has existed or is about to show itself. The possibility of conveying diphtheric infection from apparently healthy to more susceptible individuals in this way cannot be ignored.

The impossibility of **disinfecting the nasopharynx**, and the danger of destroying, by strong chemicals, the complementary bodies of Ehrlich which are necessary for the natural destruction of infecting bacteria, decide J. J. Mackenzie² in favor of using only the mildest washes for the nose and throat in diphtheria. He attempts in every way to stimulate the mucous membrane to carry out its normal function.

Denis³ calls attention to the fact that the beginning of **convalescence from diphtheria** is usually accompanied by more or less marked **bradycardia**, but the pulse-rhythm is perfect, the volume good, and the tension normal or nearly so. Bradycardia with **pulse of very low tension** is, on the other hand, of **gravest prognostic import**, and is often the precursor of death.

Boutin⁴ considers that a **profound anorexia** is a valuable sign of the threatening danger of **cardiac paralysis** in convalescence from diphtheria, of which vomiting and violent abdominal pain are also significant symptoms.

G. Bourcart⁵ reports the result of researches as to the **persistence of the diphtheria bacillus** in convalescence and its presence in the throats of **exposed healthy subjects**. Out of 30 adults exposed to diphtheria, not one showed the Klebs-Löffler bacillus. The presence of this organism in healthy individuals must then be considered exceptional. On the other hand, 18 % of the children exposed to diphtheria showed the presence of the bacillus. In 65 % of diphtheria cases who had been treated with antitoxin, the bacilli disappeared with the false membrane; in 20 % the bacilli were found during convalescence; only in 15 % was there marked persistence of the germs. In exceptional cases they persisted several months after infection. If we examine every day or two after the membrane has vanished, we find atypic forms of the bacillus, whose virulence is, as a rule, much less than that of the typical form. An example of **unusual persistence** is cited by F. J. Clendennen,⁶ in which bacilli were found for **3 months and 3 weeks** in the throat of a child after an acute attack. The acute symptoms lasted only 2 weeks. Complete cessation of all local applications was just as unsuccessful as were the most active measures to destroy the bacilli.

L. G. Simon⁷ concludes that **failure of the leukocytes to increase**

¹ Jahrb. f. Kinderheilk., 1903, lviii.

² Canadian Jour. of Med. and Surg., July, 1903.

³ Rev. mens. des Mal. de l'Enf., Dec., 1903. ⁴ Progressive Med., Mar., 1904.

⁵ Rev. mens. des Mal. de l'Enf., Sept., 1903.

⁶ Intercol. Med. Jour. of Australasia, July 20, 1903.

⁷ Arch. de méd. des Enf., Oct., 1903.

in number within 4 hours after repeated injections of antitoxin in children denotes a **fatal outcome** of the disease, whereas a rise in the leukocytes gives a favorable prognosis. The leukocytic reaction in adults is less marked and must be interpreted with more reserve.

The value of **prophylactic injections** of diphtheria antitoxin is gaining increased attention. The Hospital for Sick Children at Toronto, in spite of great care, has never been free from diphtheria since its establishment, but J. S. A. Graham¹ has noted a marked diminution in the incidence of the disease since the introduction of prophylactic injections and has found no unpleasant consequences of any importance. Augustus Caille² proposes to immunize young school-children once or twice during the school-year with diphtheria antitoxin and thereby to lessen the mortality from primary diphtheria, and from scarlatina and measles complicated by diphtheria. So far no deductions can be drawn from his own experience, Zuppinger³ records the results of 1000 prophylactic injections given to the brothers and sisters of children suffering from diphtheria. Of these, only 18 were attacked by the disease, and in 11 of them, as the symptoms appeared shortly after the injection, the presumption was that they had already been infected. As a rule, from 200 to 300 units of antitoxin were injected, and the effect lasted from 3 to 4 weeks. Zuppinger also reproduces the compilations from different countries submitted to the Hygienic Congress at Brussels, which show that 98 % of those receiving prophylactic injections escape diphtheria altogether.

The **influence of serum treatment on the mortality of diphtheria** is decidedly favorable, says Eric Faber.⁴ The statistics of 3137 cases treated in 8 years in the Blegdamshospital in Copenhagen show that the lowered mortality is due to the neutralization of the diphtheric toxins. Stenosis and pulmonary complications are less markedly benefited. The earlier the treatment is instituted, the less danger is there of death from diphtheria intoxication. The mortality among laryngeal cases is usually due to extension of the disease downward or to pneumonia, hence the lowering of the death-rate is less noticeable in this group of cases.

Louis Fischer⁵ believes that there is danger of placing too much reliance in the **specific nature of antitoxin** in the treatment of diphtheria and of disregarding other vital necessities. The indication next to antitoxin is for restorative treatment, especially by nourishment. It must also not be forgotten that antitoxin is of no use in combating the streptococemia seen in cases of mixed infection.

From careful observation of 21 cases where combined infection with **measles and scarlatina** had occurred Hukiewicz⁶ finds that the greatest difficulty in diagnosis occurs when measles precedes the scarlatinal eruption. When the scarlatinal eruption occurs first, the rubeolar exanthem is apt to be characteristic in type and the diagnosis not hard

¹ Canad. Practit. and Rev., vol. xxviii, No. 12. ² Arch. of Ped., Oct., 1903.

³ Wien. klin. Woch., 1904, No. 2.

⁴ Jahrb. f. Kinderheilk., Bd. lxx, Heft 5.

⁵ Med. News, July 18, 1903.

⁶ Jahrb. f. Kinderheilk., 1904, lxx.

to make. The scarlatinal eruption which follows rubeola appears on the chest and legs in large, smooth, elevated, bright red, almost shining patches, covering areas as large as the palm of one's hand or more, resembling extensive urticarial lesions, and involving those parts of the skin where the measles rash has not fully developed. In a few hours this rash fades, the swelling is less, and one finds only the typical smooth scarlatinal rash, which in its turn dies away, showing the pale-brown, washed-out measles spots beneath. Hukiewicz believes that measles increases the predisposition to scarlatina. The latter disease followed measles in 2 infants 6 months old, who are not susceptible to scarlatina, as a rule, at that age. The greatest susceptibility to scarlatina is in the second week of incubation and during the prodromal stage of measles, and the least during the first week of incubation and after the eruption is fully out.

From the study of an epidemic of measles Otfried Müller¹ found that Koplik's spots were present in four-fifths of the cases, and often on the first day of the disease. Koplik's spots are not pathognomonic of measles, for they have been repeatedly found in rubella. The diazo-reaction is nearly always present at the height of the disease. Besides the usual type of the febrile stadium of measles, two other forms occur. The fever may rise gradually with intermissions, or, rarely, it may rise suddenly on the third or fourth day, without preliminary warning, to its full height at the time of the exanthem. Relapses in measles are not very rare. Jules Comby² reports 3 cases with intervals of 3 to 4 weeks between the attacks. The eruption was typical in all 3. The prognosis is usually good in these relapses, and complications are uncommon. Warren H. Gilman³ reports a case of aphasia complicating measles in a boy of 9 years. On the fifth day of the disease, when convalescence was seemingly about to begin, he became restless, with slight delirium, followed by semiunconsciousness. There was complete inhibition of the auditory and visual centers and of the higher speech center. There was no paralysis. The aphasia was the last symptom to disappear, but recovery was complete within 15 days.

David M. Paton⁴ is convinced of the value of guaiacol carbonate in the treatment of the catarrhal symptoms of measles. For the vomiting, a little bismuth may be added. In his experience the usual sequels are aborted by this drug.

F. H. Dillingham,⁵ in discussing the neglected subject of rubella, will not admit the existence of Duke's fourth disease, and thinks it is very likely that many second attacks of scarlet fever or rubeola are, in reality, instances of rubella.

Two cases of acute suppurative thyroiditis due to the streptococcus are reported. In one, observed by G. B. Allaris,⁶ the confluent pustules of varicella led to the formation of a small abscess in the ab-

¹ Münch. med. Woch., Jan. 19, 1904. ² Arch. de méd. des Enf., Aug., 1903.

³ Boston M. and S. Jour., Aug. 13, 1903.

⁴ Lancet, Nov. 21, 1903.

⁵ Amer. Med., Aug. 15, 1903.

⁶ Monats. f. Kinderheilk., Dec., 1903.

dominal wall and subsequently in the thyroid gland. In the other case, reported by G. Caccia,¹ the infection was probably introduced through **vaccination**. Recovery followed simple incision in both cases.

William A. Edwards² draws attention to the relationship between **tuberculosis** in children and **varicella gangrænosa**. The latter infection is probably due to the usual pathogenic organisms, especially the streptococcus. The presence or absence of tubercle bacilli in the cutaneous lesions, however, does not seem to have been demonstrated.

Gregory Jacobson³ calls attention to **two abnormal types of pertussis**. Cases of the **abortive type** are hard to diagnose, unless contagion can be proved to have occurred, and are apt to spread the disease, while chronic pulmonary lesions not infrequently follow. Fever, anorexia, coated tongue, nausea, vomiting, mucous diarrhea, and marked prostration with loss of flesh characterize the **dyspeptic type**, and are probably due in part to a toxic gastritis. These symptoms yield to careful diet (milk only) and withdrawal of all drugs.

In 34 cases of **whooping-cough** Paul Reyher⁴ found the **pole-bacteria of Czaplewski** present in the sputum, the nasal and aural secretions, and at postmortem in the laryngeal mucus and superficial epithelium. That the pole-bacterium is the specific cause of pertussis requires further bacteriologic experimentation and proof, but that it is an etiologic factor of importance seems certainly highly probable, in view of its constant presence in the sputum.

Guida⁵ suggests that strong depression of the tongue, which brings the epiglottis into view, is sure to bring on an attack of the characteristic cough. **Pertussis** may thus be recognized, without having seriously offended the child.

Monti's⁶ **treatment of pertussis** consists in the inhalation of carbolic acid and menthol, and the internal administration of belladonna and quinin in large doses. The sick-room should be well lighted, well aired, and kept at an even temperature. Soltman⁷ corroborates Bravo, who advocates the use of **cypress oil** for the cough. Ten to 15 gm. of a 20 % alcoholic solution are poured on the pillow, upper part of the bed, and underclothes of the child 4 or 5 times a day. The oil stains the linen, but is otherwise unobjectionable.

At the Edinburgh City Hospital⁸ the best results have been obtained from the **open-air treatment** of the **bronchopneumonia** complicating **pertussis**. The good effects noted were increase of appetite and strength, less irritability, and less cyanosis. At night, on rainy days, and in winter the patients were kept in a large airy ward with the windows open. The main contraindication to the open air was laryngitis.

G. Arnheim⁹ has studied at **autopsy** 8 cases of pertussis which died during the attack. All but one showed the mucosa of the trachea and

¹ Riv. di clin. Pediat., 1903, vol. i, No. 9. ² Arch. of Ped., Aug., 1903.

³ Arch. de méd. des Enf., 1903.

⁴ Jahrb. f. Kinderheilk., 1903, lviii.

⁵ Arch. di Patolog. Clin. infant, vol. ii, No. 2.

⁶ Bull. Gen. de Therap., 1903 (abs. Buf. Med. Jour., July, 1903).

⁷ Therap. d. Gegenw., xlv, No. 3.

⁸ Scottish M. and S. Jour., Jan., 1904.

⁹ Berl. klin. Woch., July 20, 1903; Virchow's Arch., vol. clxxiv, p. 530.

bronchi covered with mucus, pus, and blood, and many desquamated ciliated epithelial cells; and in all but one (in the eighth to the ninth week) the **Czaplewski pole-bacillus** was demonstrable. The bacteria find lodgment in the most sensitive portion of the tracheal mucosa, which is richly supplied with nerve-terminals, and then penetrate the mucosa deeply. This factor and the tenacity of the sputum help to explain the frequency of the paroxysms of cough. Arnheim concludes that *Pertussis* is an infectious catarrh of the mucosa of the respiratory tract, especially of the trachea; that many groups of the bacilli are found in this tract, and, in moderate numbers, in any bronchopneumonic areas that may be present. The attacks of coughing are to be looked upon as a healing process, since the sputum carries away many bacteria. After the colonies of these bacteria are dislodged, recovery follows.

Rudolf Neurath¹ found the following **pathologic changes in the central nervous system** in 17 fatal cases of *pertussis*: edema and hyperemia of the meninges, vascular injection, and cerebral hyperemia. Often the brain was normal in appearance. Microscopically there were thickening of the pia mater, marked infiltration with round-cells and proliferated connective-tissue cells, blood extravasations in and below the pia, and dilation of the vascular and pericellular lymph-spaces.

Out of 621 cases of **cough** seen at the Royal Waterloo Hospital during the last 2 years A. W. Fuller² finds that 371 were suffering from some **nasopharyngeal condition**, relief of which was usually followed by complete cure of this symptom.

Pollak³ narrates the second case in medical literature where **scurvy was combined with pertussis**. The venous stasis in *pertussis* of itself tends to cause hemorrhage, and in this case epistaxis, submucous and subcutaneous hemorrhages recurred so frequently after the paroxysms of cough that severe anemia developed and death soon followed. Gangrene of the lips, tongue, left cheek, and soft palate complicated the picture.

The question of the relative importance of the human and bovine varieties of the tubercle bacillus in the causation of tuberculosis in children is receiving increased attention since Koch's recent declaration.

Nathan Raw⁴ is of the opinion that man is attacked by **two distinct varieties of tubercle**, one by infection from person to person, the other from bovine bacilli in milk or meat. The clinical types of tuberculosis in young adults and in children are essentially different. In one the disease is usually limited to the lung; in the other, affections of the joints, glands, and bones are much more common. The experiments of Macfayden and McConkey⁵ have shown that tubercle bacilli are present much more frequently in the mesenteric glands than ordinary autopsies would lead us to suppose. In more recent experiments Ravenel⁶ has fed tubercle bacilli to dogs, and examined the chyle and mesenteric glands

¹ Wien. klin. Woch., 1903, No. 46.

² Arch. f. Kinderheilk., vol. xxxviii, Nos. 3 and 4.

³ Brit. Med. Jour., Aug. 29, 1903.

⁴ Med. News, May 7, 1904.

⁵ Lancet, Mar. 26, 1904.

⁶ Brit. Med. Jour., 1903.

3½ to 4 hours later. He found that the tubercle bacilli had passed through the intestinal wall, probably in large numbers, judging from the lesions produced in guineapigs inoculated with the chyle. Careful examination of the intestinal mucosa (in 2 cases by microscopic sections) failed to discover any lesion. These results seem to support Raw's view, that many children acquire a mild infection through cow's milk which becomes localized in the mesenteric glands and ends in complete recovery. Raw's experience with nearly 300 cases of **tabes mesenterica** has been that cow's milk formed at least a portion of the diet for a considerable period. In only 1 out of 34 fatal cases was there any history of phthisis in the parents. Raw believes that the most reasonable theory in regard to so-called **scrofula** and its manifestation is that the enlarged glands are produced by absorption of tubercle bacilli in the milk, through the tonsils and pharynx. There is also much evidence to suggest that **acute miliary tuberculosis** is bovine in origin. On the other hand, Raw has noted in certain cases of **tabes mesenterica** confirmed at autopsy that abdominal symptoms, at first indistinguishable from those of intestinal catarrh, have definitely preceded the lesions in the lung which develop under observation. In these cases the path of infection from mesentery to lung is obvious. He believes, therefore, that bovine tuberculosis is more virulent for children than human tuberculosis, and that it is accountable for **tabes mesenterica** and other varieties of abdominal tuberculosis. The comparative infrequency of tubercular infection through milk may be explained in part by the fact that none but tubercular lesions in the udder or teats of the cow cause the appearance of tubercle bacilli in milk. Cautley¹ believes that, among the poor, milk may be infected by the human as readily as by the bovine bacillus. He considers **condensed milk** a potent factor in the etiology of tuberculosis, since this diet lowers the infant's vitality. George Carpenter² admits that certain cases of tuberculosis are primarily abdominal, but thinks that other channels are much the more usual avenues of infection. He objects to the term **tabes mesenterica**, under which it is possible that many cases of **marasmus** and **indigestion** are included.

From a very thorough résumé of literature G. M. Kober³ concludes that the danger of the **transmission of tuberculosis** from tubercular cows to man is real, and cannot be measured by the actual number of reported cases, but should be judged, in part, by inoculation and feeding experiments and by accidental wound infections. Further research is needed to determine the frequency of primary intestinal and abdominal tuberculosis in cases which come to autopsy, and bacteriologic examination should be directed to the existence of the two types of tubercle bacilli originally referred to by Smith, and whether the bovine type predominates in the so-called scrofulous lesions. Cecil Price-Jones⁴ finds that **alimentary tuberculosis** comprises about 25 % of cases in England, but that the chances of its being due to infection by human or other varieties of the tubercle bacillus are greater than that of infection by the

¹ Brit. Med. Jour., Aug. 29, 1903.

² Am. Jour. Med. Sci., Oct., 1903.

³ Ibid.

⁴ Practitioner, Aug., 1903.

bovine bacillus. In 76 autopsies upon the bodies of children from 1 to 16 years of age Heller and Wagner¹ found that 16 (21%) showed **primary tuberculosis** of the **intestinal tract**. In 13 of these the tubercle bacillus was actually demonstrated.

At the Pediatric Section of the Society of German Naturalists Ganghofner² (Prague) stated that the bacilli of bovine tuberculosis rarely give rise to human tuberculosis by transmission in the food. The study of autopsies on 973 children who died from acute infectious diseases (diphtheria, measles, scarlatina, variola) revealed only 5 cases in which the tubercular lesions were limited to the intestine and mesenteric glands; that is, there were but 5 cases of **primary intestinal tuberculosis**, or 2 % of 253 cases of tuberculosis. Since the human tubercle bacillus is ubiquitous and finds access to the mouth and intestinal tract, one cannot be sure even in cases of primary intestinal tuberculosis that the source of infection is bovine. Ganghofner also compared the statistics of human tuberculosis in certain sections with the official data of **bovine tuberculosis** and **tuberculosis of the udder**. Nowhere was there any parallelism between the two diseases, and often human tuberculosis was rife where bovine tuberculosis was scarce, and vice versa.

G. A. Alfaro³ (Buenos Aires) believes that children may inherit a soil favorable to the development of tuberculosis, but that in the great majority of cases infection occurs after birth, usually by **inhalation**—*i. e.*, through the respiratory tract. Out of 45 autopsies only 2 showed lesions primarily intestinal in origin, 4 cases had intestinal ulceration, 2 tubercular ulcers of the stomach, and 2 tubercular pericarditis. Alfaro distinguishes between acute miliary tuberculosis (typhoid and bronchopneumonic types) and Landouzy's "typhobacillosis," which is often curable. In infancy it is important that we suspect the existence of a diffuse tubercular infection, even when the clinical picture is that of a fairly well-defined localized process. Injections of Koch's tuberculin No. 1 in increasing doses are of decided value in confirming the diagnosis if the reaction is positive (rise of 2° to 3° F.).

R. G. Freeman,⁴ in summing up his investigations on this subject, finds that tuberculosis in infancy arises most often from either the respiratory or the alimentary tract, but that the comparative frequency of either of these modes of infection has not been definitely determined. He believes, however, that careful microscopic examinations and animal inoculations will probably show a much greater proportion of mesenteric and intestinal involvement than is now credited.

Cornet, Jeill, Brandenburg, and other investigators have noted that the largest number of cases of **tuberculosis in children** occur during the **second and third years**. A satisfactory scientific explanation of this has been wanting. Dieudonné⁵ has found tubercle bacilli in the dirt from the hands and in the nasal secretion of a number of infants between 9 months and 3½ years of age. The bacilli were typically pathogenic for

¹ Münch. med. Woch., 1903, Nos. 47 and 48.

² Jahrb. f. Kinderheilk., 1903, lviii.

⁴ Med. Rec., May 7, 1904.

³ Arch. de méd. des Enf., Oct., 1903.

⁵ Brit. Med. Jour., Sept. 26, 1903.

guineapigs. He concludes that this frequency of the disease in the second year may be explained by the fact that the infant is at that time crawling on the floor, and thus becomes infected through the medium of the hands.

In order to explain **lengthy febrile attacks** during infancy, G. Mya¹ lays stress on the characteristic hyperthermophilia of early age, which is especially marked in subjects of inherited latent gout, syphilis, and tuberculosis. It is necessary to forego the tendency to attribute doubtful fevers to a gastrointestinal origin. The symptoms of alimentary infections are usually evident fairly early. Latent infections, such as a cystitis due to the *Bacillus coli* or permanent infection of the pharyngeal lymphatics, must not be forgotten. The most frequent cause of febrile attacks without distinctive symptoms is **latent tuberculosis**. In any obscure case, therefore, having excluded gastrointestinal infection and typhoid fever, a nutritious diet should be prescribed as being the best means of counteracting the perils of latent tuberculosis.

Zuppinger² describes a case of **generalized tuberculosis of the glandular apparatus** in a child 8 years old resembling **pseudoleukemia** in its clinical course, with periods of high intermittent fever alternating with fever-free periods characterized by euphoria and diminution of the splenic and glandular swelling. Associated with the general glandular swellings, which included the mediastinal and retroperitoneal glands, was extensive amyloid degeneration of the liver, spleen, kidneys, and intestines.

Acute primary pharyngeal tuberculosis in a child of 6 years is described by Maurice Hertz.³ The uvula, soft palate, palatine arches, and posterior wall of the pharynx were almost covered with small confluent ulcers. Miliary tubercles were present on the uvula. The disease began suddenly with sore throat, dysphagia, and constitutional symptoms, and ended fatally in 3 months. The secretions were full of tubercle bacilli, and there were indications of involvement of the lungs. The course of the disease resembles acute miliary tuberculosis.

G. Carrière⁴ reports a case of hypertrophic **tubercular cirrhosis** with fatty degeneration of the liver in a child 6 years old, and discusses the differential diagnosis and pathologic findings. The mesenteric glands were caseated.

A. Josias and Jean-Ch. Roux⁵ consider the **best treatment** for tuberculosis in children to be **raw beef-juice** and **raw meat**, associated with the best hygienic conditions obtainable. All cooked meat they exclude from the diet. Four out of 8 cases of tubercular peritonitis were cured, 2 died, in 2 the result was uncertain. Of 16 cases of pulmonary tuberculosis in the first and second stages, 6 were cured, 8 improved, 2 died. Of 17 cases in the third stage, 4 improved, 1 remained stationary, and 12 died. A rapid gain in weight from the beginning of the treatment gives a good prognosis. They give daily to each child the juice from 16

¹ Riv. di. Clin. Ped., Nov., 1903.

² Jahrb. f. Kinderheilk., lxx, Heft 3.

³ Arch. f. Laryngol. and Rhinol., xiv. ⁴ Arch. de méd. des Enf., Dec., 1903.

⁵ Rev. de la Tuberculose, July and Oct., 1903.

ounces of raw meat, and from 3 to 5 ounces of raw meat given in cold bouillon.

Hochsinger¹ believes that **hydrocephalus** in the first months of life is frequently **syphilitic** in origin. Hereditary syphilis gives rise to early mild rachitis, diffuse periostitis of the bones of the cranium, enlargement of the circumference of the skull, and often causes leptomeningitis and endarteritis. The measurements of these syphilitic hydrocephalic heads are greater than those of rachitic pseudohydrocephalic infants of the same age (under 6 months). Mixed treatment will cure a large percentage of these cases.

A rare case of **hereditary syphilis** with cirrhotic changes in the **liver** and **spleen**, jaundice, and edema of the body circumscribed to the area below the umbilicus, is the subject of a report by E. Rist and M. Salomon.² The child was jaundiced at 2 months, and in the third month died after profuse hemorrhages from the bowel. At autopsy the liver showed diffuse cirrhotic changes, some of long standing and others more recent in origin. The small branches of the portal vein were almost entirely occluded by fibrous tissue. The authors believe that the marked involvement of the liver and spleen and the absence of other manifestations of syphilis prove that the infection must have occurred at a very early period of intrauterine life.

A. Breton³ recommends large doses of biniodid of mercury hypodermatically for **hereditary syphilis**, $\frac{3}{4}$ up to 1 grain, held in solution by potassium iodid, 1 gram, and distilled water. The injections were well tolerated and gave prompt results.

J. L. Morse⁴ reports 4 cases of **tonsillitis** which caused acute **nephritis**, and believes that this infection, to which acute endocarditis has also been ascribed, can no longer be regarded as a simple disease of little importance. D. J. M. Miller⁵ is inclined to consider the tonsils as a portal of infection in a case where erythema, purpura, multiple arthritis, abdominal colic, melena, and hemorrhagic nephritis occurred in a child of 10 years who gave no history of rheumatism or chorea. Convalescence was completed after 10 weeks.

Lawrence T. Royster⁶ found the fusiform **bacillus and spirillum of Vincent** in smears from a chronic tonsillar ulcer. The lesion consisted of a "patch of grayish deposit, nearly as large as the tonsil, slightly depressed, and having a very ragged outline." The membrane or slough separated easily, leaving a raw, bleeding surface. The tonsil was hard and indurated and there was marked lymphatic enlargement. Diphtheria was excluded by the result of culture and the chronicity of the case; a certain diagnosis from syphilis, however, could be made only by the microscope.

In the light of our present knowledge it does not seem advisable to accept as pathologic entities such conditions as melæna neonatorum,

¹ Wien. med. Woch., 1904, No. 20.

² Rev. mens. des Mal. de l'Enf., Sept., 1903.

³ Rev. mens. des Mal. de l'Enf., Dec., 1903, xxi. ⁴ Arch. of Ped., May, 1904.

⁵ Arch. of Ped., June, 1904.

⁶ Arch. of Ped., 1903.

Buhl's disease, Weil's disease, hemophilia of the newborn, etc. S. McC. Hamill and W. R. Nicholson¹ prefer to include all these conditions under the term **infections of the newborn**. Exact classification must be made on a purely bacteriologic basis. According to their observations, all of the clinical symptoms described under the above headings may exist in any one of a number of different infections. Hemorrhagic conditions in the newborn may be due to such causes as trauma at birth, fetal malformations, asphyxia, and syphilis; in the vast majority of instances, however, they are due to infection. Strong evidence of this is found in the fact that they are limited almost exclusively to institutions and, not uncommonly, are epidemic. Bacteriologic investigations usually fail to demonstrate the same microorganisms in all the cases, hence the infection is probably due to deficient technic in the care of the child rather than to defective conditions in the ward. Various microorganisms have been found—most commonly the streptococcus, *Bacillus coli communis*, and the staphylococcus. The opportunities for infection in institutions are extraordinarily great and can be avoided only by exercising the greatest precaution. Air-infection seems possible, although probably infrequent, otherwise we should find more instances of an infection due to one species of organism. Among other causes are the mother's milk, especially when a lesion of the nipple exists; the bath water, when contaminated by another child; infected bedding. Admitting these possible sources, the authors are inclined to believe that the poorly trained or careless nurse is usually responsible for the infection. The buccal cavity, tonsils, and alimentary tract are the most common portals of entry for infection; next in order, the lungs. The frequency of infections through the cord is probably overrated, and infection through the skin, nose, ears, etc., rarely occurs. Snow² believes that the amniotic fluid is a great source of danger when the sac has been prematurely ruptured. In these cases the colon bacillus is usually the infecting organism. The onset of the disease may occur before, during, or after labor; usually during the first week of the infant's life, more rarely as late as the fifteenth day. The symptoms in order of their appearance may be said to be fever, enteritis, and cutaneous eruptions, with rapid emaciation. When hemorrhage, nervous manifestations, cyanosis, and dyspnea or icterus are observed, the diagnosis is established. The nature of the infection can be determined by blood-cultures. The gross changes found at autopsy may be summed up in the words "congestion" and "hemorrhage," while, in addition, are found the histologic changes common to all infectious conditions. Preventive measures are far more important than treatment, since the prognosis in these cases is distinctly bad. Absolute cleanliness in all particulars is essential. Routine cleansing of the infant's mouth is not advisable unless it is done under the most aseptic conditions. Erosions and fissures of the mother's nipple and puerperal septicemia necessitate the immediate withdrawal of the infant. Isolation of a suspicious case should be practised whenever possible, and in all cases infants should be kept

¹ Arch. of Ped., Sept., 1903.

² Ibid.

in separate wards from the mothers, in charge of a special nurse. Delestre and Hutinel note marked improvement following blood-letting (15 to 20 cc.) and replacing this with artificial serum (20 to 30 cc.). In other respects treatment is symptomatic. Recently H. B. Stevens¹ reports 1 death and 2 recoveries after treatment with gelatin by the mouth.

De Benedetti² believes that *Bacterium coli* is more often the pathogenic agent in **purpura simplex** than is generally supposed. The observation of 17 cases shows: (1) the antecedence or coexistence in nearly every case of acute or chronic gastrointestinal disturbances or like toxic-infectious conditions; (2) the frequency of indicanuria; (3) the presence of *Bacterium coli* in all cases studied bacteriologically; (4) the absence of *Bacterium coli* from the purpuric spots except in one case; (5) the presence of the *Bacterium coli* in the urine in 2 cases; and (6) the greater or less virulence of the microbes found. De Benedetti rarely found *Bacterium coli* in the circulation; he ascribed the alteration of the blood-vessels to the action of toxins.

The danger of a mistaken diagnosis of **intussusception** for **Henoch's purpura**, or vice versa, is well illustrated from case-reports by G. A. Sutherland and Harold Burrows.³ Intussusception may indeed occur in a case of purpura, due to interstitial hemorrhage into the wall of the colon, with subsequent paralysis of the affected portion, the increased peristalsis of the adjoining gut producing its invagination. The most important symptom of intussusception is probably tenesmus, whereas the pain in purpura, if it occurs, is usually described as colicky, but without tenesmus. In any case careful inquiry should be made as to the previous health, and the occurrence of purpuric spots, either in the past or in the present, should be rigorously excluded.

Henry G. MacAdam⁴ discusses **purpura hæmorrhagica fulminans**, and reports a case in a child of 5 years which appeared hopeless, but in which the patient recovered on large doses of adrenalin solution. Twenty drops was first administered, followed, in 15 minutes, by 10 drops, and the latter dose was repeated at intervals of 3 hours for 3 weeks.

J. R. Clemens⁵ and J. E. Winters⁶ have each called attention to the irregular evening rise of temperature without definite symptoms, which is sometimes seen as the sole evidence of an attack of **rheumatism** in children. It is usually accompanied by anemia. Later we may find an endocardial lesion; or an attack of chorea may follow, which points to the true nature of the previous attack. Winters considers that in the case of a child with elevated temperature, no diagnosis is complete until rheumatism has been excluded. The history of an attack of torticollis or the frequent occurrence of "growing pains" may point to the true condition.

J. E. Winters⁷ insists that **rheumatism** is caused by nonneutralized acid products of proteid metabolism, and that it is cured by basic constituents of food. The large appropriation of potash by the growing

¹ Boston M. and S. Jour., May 26, 1904.

² Arch. de méd. des Enf., Apr., 1904.

³ Med. Rec., Aug. 22, 1903.

⁴ Med. Rec., Jan. 9, 1904.

⁵ Brit. Jour. Child. Dis., Jan., 1904.

⁶ N. Y. Med. Jour., Aug. 8, 1903.

⁷ Med. Rec., Jan. 9, 1904.

muscles, and the exuberance of acid-products of the muscle-laboring child, make the balance between supply and demand of minerals close and easily lost. In the **management** of the rheumatic child he therefore advocates attention to the digestive organs and to the diet. When the tongue is coated, calomel should be given, followed by rhubarb and soda, the latter combination to be continued as long as the tongue is furred. Milk should be the sole diet as long as evident symptoms remain. The first addition should be a cereal without sugar; then vegetable soups, bread, potato, green vegetables, and fruit. When animal food is to be added, it should be in the form of meat. Animal broths are useful only as stimulants to the appetite after all rheumatic manifestations have passed. For acute active manifestations, salicylate of soda from oil of wintergreen is a specific.

Charles J. Aldrich¹ objects to the terms **chorea major** and **pseudo-chorea**. The former belongs properly to hysteria or the psychoses; the habit-spasms differ so essentially from true chorea that the term "pseudo-chorea" has nothing to recommend it. Substantiating the infectious theory of the disease C. F. Judson² reports a case of **minor chorea** in which **pneumonia** was a complicating factor. The child had had 2 choreic attacks of moderate severity in earlier life, in one of which arthritis and endocarditis had occurred. She had had repeated attacks of quinsy. The reported attack began as a general infection, with fever, gastroenteritis, and pain in the large joints. Choreic movements commenced one week later and assumed a most pronounced type, with marked psychic manifestations. During the fourth week pleurisy and pneumonia developed, while the severity of the choreic movements abated. At this time the heart was greatly dilated and involvement of the joints recurred. Antirheumatic treatment was followed by immediate good results, and recovery followed at the end of the seventh week. The leukocytosis had reached at one time 33,000, but cultures from the blood were negative.

D. B. Lees,² in discussing the pathology and treatment of **chorea** in childhood, considers that every case should be looked upon as presumably rheumatic. Since there is some evidence that the diplococcus isolated from the blood of rheumatic patients by Poynton and Paine may be found in the cerebral cortex of fatal cases of chorea, Lees would define the majority of cases as instances of "cerebral rheumatism." On this basis he treats all cases with **salicylates**, insisting on large dosage—for a child from 6 to 10 years of age, 100 grains a day, increasing to 200. To prevent salicylic air-hunger he administers double the amount of bicarbonate of soda with each dose of the salicylate. He believes that failure of the pulse during such treatment may be ascribed to acute rheumatic dilation of the left ventricle and not to the remedy. Careful daily examination of the heart should always be made. Deafness, tinnitus aurium, headache, etc., are rare in children; vomiting may necessitate discontinuing the drug for a short period, and beginning

¹ Arch. of Ped., Nov., 1903.

² Arch. of Ped., July, 1903.

³ Brit. Med. Jour., Aug. 29, 1903.

again with a smaller dose. Rest in bed is desirable for every case, however mild.

William Ewart¹ believes that some of the good results from Lees' treatment may have resulted from the carbonic-acid gas generated from the bicarbonate of soda.

Zaoussallov² obtained prompt results from salicylate of soda in 4 cases of chorea which had resisted arsenic, iron, bromids, etc., although there was nothing to suggest rheumatism or heart complications. H. Schröder³ warns against **too large doses of arsenic** in the infectious type of chorea. In his experience unwelcome results ensued on the tenth to the twelfth day, when the amount of Fowler's solution had been augmented to 30 to 36 drops in the 24 hours; such as sudden rises of temperature, rapid pulse, disturbed cardiac action, increase in the area of cardiac dulness and in intensity of heart-murmurs, rheumatic manifestations, herpes, digestive disturbances, and increase in frequency of choreiform movements. The neuropathic cases tolerate arsenic well, on the contrary, and the course of the disease is shortened by arsenical treatment.

James Burnet⁴ records 2 cases of acute **chorea** in which the symptoms rapidly subsided after the expulsion of *Tænia solium*. Neither patient gave a history of rheumatism; both were highly neurotic girls and the usual treatment for chorea had failed signally.

Theodore Fisher⁵ estimates that about 50 % of cases of chorea will develop **cardiac disease**; but in the absence of a history of rheumatism this complication is unlikely to occur. Pulmonary systolic murmurs, in chorea are probably due to dilation of the right side of the heart; systolic apical murmurs may indicate dilation of the left side.

It is only within the past 10 years that the occurrence of **uncinariasis** in this country has been recognized. C. W. Stiles⁶ has found the disease by no means uncommon among children in the Southern States. Forty-four out of 427 children in orphan asylums were found to be infected. Infection usually occurs through the agency of food or water, or by direct conveyance on dirty hands, etc. The symptoms are briefly those of a **grave anemia**. Mental dulness and apathy are commonly observed, and there is a tendency to edema. Fortunately, treatment by thymol, followed by iron and tonics, is usually promptly effective.

DISEASES OF THE ALIMENTARY TRACT.

Circumscribed **lymphangioma** of the tongue of 18 months' duration was observed by H. Gaudier and Camus⁷ in a child of 14 years. The tumor involved a portion of each side of the tongue, was of hard consistence and slow growth. For periods of 2 to 3 days at a time throughout the disease exacerbations occurred, with pain, dysphagia, difficulty of

¹ Brit. Med. Jour., Aug. 29, 1903. ² La Sem. méd., xxiv, No. 9.

³ Fortschritte d. Med., July, 1903. ⁴ Brit. Jour. Child. Dis., Apr., 1904.

⁵ Brit. Med. Jour., Aug. 29, 1903. ⁶ Editorial: Arch. of Ped., Dec., 1903.

⁷ Ann. des Mal. de l'oreille, larynx, etc., Oct., 1903; abs. Arch. de méd. des Enf., Apr., 1904.

speech, and salivation. On removing the tumor, which was the size of an almond and resembled a small cauliflower, the microscope showed great hypertrophy of the papillae of the tongue, many of which exhibited at their periphery cystic dilations containing granular matter and leukocytes.

Reports of **sublingual growths** in infants of the type described by Riga and by Fede seem to occur almost exclusively in Italian literature. Samuel Arnberg¹ reports one example of the disease which was seen at Johns Hopkins Hospital and reviews reported cases. The tumor usually begins as a slight abrasion on the frenulum linguae and soon appears as a hard, pearly white growth surrounded by a red margin; the center may show some sloughing. It may grow to about 1 cm. in diameter and several millimeters in thickness; it appears to be purely localized. Traumatism over the hardened gum in sucking, or over the lower incisor teeth, is generally accepted as the exciting cause. Great diversity of histologic structure is reported. The tumor has been described as a papilloma, fibroma, congenital fissural angioma, and chronic inflammatory hypertrophy of the mucosa. Its frequent association with serious or fatal gastroenteric disorders has led some authors to attribute constitutional effects to it. This relation has not been established, however, and the tumor is generally believed to be an independent manifestation. It usually occurs under the age of 2 years. Excision will prove to be the shortest and simplest cure.

A fatal case of **generalized infection** with thrush is reported by O. Heubner.² Without close attention it would have been erroneously diagnosed as diphtheria.

A. P. Breclj³ describes **pseudodiphtheric** lesions of the soft palate in the newborn. Extensive necrosis, ulcers, and pseudomembranous deposits on the mucous membrane result from traumatism and bacterial activity. The tissues are more deeply and extensively invaded than in the typical Bednar's aphthas. Epstein's view that this pseudodiphtheria is of septicemic nature is shared by Breclj.

Th. Jemma⁴ describes **primary gangrene of the throat** in a boy 11 years of age, involving both tonsils and the root of the tongue. Hemorrhages occurred into the skin and from the stomach. The child died in 3 weeks. Bacteriologic examination showed nothing characteristic.

A **perforating gastric ulcer** in a child of 26 months is reported by J. P. Parkinsen.⁵ No trace of tubercle, which is the usual cause of gastric ulceration in children, could be found.

Cautley⁶ bases the diagnosis of **hypertrophic stenosis of the pylorus** on the history of progressive wasting; vomiting, usually forcible, unaccompanied by nausea, rather infrequent at first, with the intervals rapidly growing less; constipation; clean tongue; sweet breath; dilation of the stomach; visible peristalsis and the presence of a tumor.

¹ Am. Jour. Med. Sci., Aug., 1903.

² Deut. med. Woch., Nos. 33 and 34.

³ Jahrb. f. Kinderheilk., lix.

⁴ La Pediatria, 1903, No. 5.

⁵ Rep. of Soc. for Study of Dis. of Child., vol. i.

⁶ Brit. Jour. Child. Dis., Jan., 1904

The true condition must be differentiated from simple regurgitation and simple gastric catarrh. From the condition of pyloric spasm without hypertrophy differentiation may be difficult, if not impossible. Cautley favors operative interference as soon as the diagnosis can be established, especially when there is present a palpable pyloric tumor. Stanim¹ is inclined to attribute more importance to **muscular spasm** than to true hypertrophic stenosis in these cases, although admitting that true cases of congenital overgrowth exist. He advises alkalis with small doses of opium, and small amounts of mother's milk at each nursing. J. Park West² thinks that a distinction should be made between those cases of congenital stenosis of the pylorus which are due to true **hyperplasia** of the **connective tissue**, in addition to **hypertrophy of the muscle**, and those in which the latter condition alone is found, the stenosis being then due to **spasm** of the hypertrophied muscle—i. e., congenital gastric spasm (Thomson). A few cases of the latter condition have been relieved by diet and treatment, but surgical intervention would be indicated in both cases, since relaxation of the spasm from medical treatment alone is rarely permanent.

The subject of **spurious tapeworms** is discussed by W. L. Bierring.³ In two recent instances the supposed segments of worms were found to be fibers from banana. The importance of a knowledge of what may be called the normal elements in the stools is well illustrated.

Leonard G. Guthrie⁴ repeats his observations on the **fatal effects of chloroform** on children suffering from a peculiar condition of **fatty liver**, and adds other examples. The acute symptoms occur some hours or even days after the child has recovered from the anesthetic and, except for the absence of jaundice and hemorrhage, a diagnosis might be made of "acute yellow atrophy of the liver." In one case even jaundice and petechias in the lung were observed. Guthrie surmises that chloroform, by decreasing oxidation, aggravated the condition of fattiness of the liver already present and so lowered the hepatic functions that ptomaines or toxins escaped into the general circulation; moreover, by its action on the kidneys it prevented the elimination of such poisons in the urine. Diagnosis of a fatty liver before operation is difficult, if not impossible. A history of repeated "bilious attacks" may indicate a fatty and incompetent liver. In such cases operation should be deferred except in cases of urgency, and ether should be the anesthetic of choice. For the treatment of the condition prompt and active purgation, venesection, and saline transfusion afford the only hope of success.

L. Hoche⁵ classifies **cirrhosis of the liver** in childhood under 7 heads: (1) The alcoholic; (2) the toxic of intestinal origin; (3) the postinfectious (after scarlatina); (4) the infectious (after prolonged suppuration); (5) the syphilitic; (6) the infectious (syphilis or by obstruction); and (7) the cardiac. In congenital syphilis the cirrhosis is diffuse, begins in the antenatal period, and involves all the elements of the gland. Ob-

¹ Arch. f. Kinderheilk., vol. xxxviii, Nos. 3 and 4.

² Arch. of Ped., Oct., 1903.

⁴ Lancet, July 4, 1903.

³ Iowa Med. Jour., 1903, p. 281.

⁵ Arch. de méd. des Enf., Nov., 1903.

literative changes occurred in the capillaries in 3 cases, and in 2 true miliary gummas were found. In the acquired form the pathologic changes are varied in severity and distribution. The diagnosis is always difficult. Many of these cases persist without marked symptoms, and end in well-developed cirrhosis in adult life. Convulsions and coma in the fatal cases frequently obscure the clinical manifestations of hepatic disease. A marked feature in all cases is the degeneration of the cells of the liver.

Maurice Perrin¹ writes on **pneumococcic peritonitis** in infants and children, based on the reports of 46 cases. Twice as frequent in infancy as in adult life, it attacks girls oftener than boys. It may be general or circumscribed and encysted. The latter begins acutely and is usually primary, while the secondary form arises insidiously, and most cases recover after operation and drainage. Pneumococcic peritonitis usually begins with diarrhea (constipation is more common in other forms of acute peritonitis), fever, vomiting, and abdominal pain. The generalized form is much more severe than the encysted type of the disease, and the prognosis is grave, especially in the septic cases, where the peritonitis is diffuse. W. P. Gerassimovitch² regards **black or bloody vomit** in children with peritonitis as a symptom of profound sepsis. It is always of ominous import.

From the discussion on the relation of the **bacillus of Shiga** to the **summer diarrheas** of children, held at the meeting of the American Pediatric Society, Washington, D. C., May, 1903, certain conclusions can be drawn. The Shiga bacillus seems to be pretty well established as a cause of a definite type of adult dysentery. It has been found in a number of cases of infantile summer diarrhea, particularly in those cases which pass mucus and blood in the stools. The opinion of most observers is that this group is probably a limited one. Much additional research remains to be done, however, before this point can be settled. Characteristic agglutinative blood-reactions were obtained in all cases (37) examined under Holt's direction. In one it persisted 27 days after the attack. On the other hand, W. H. Park has found that a 1 to 10 reaction is common in children having chronic intestinal diseases when no dysentery bacilli [Shiga] have been present. In adults, under the same conditions, a reaction of 1 to 50 or even higher has been obtained. Decision as to the result of Flexner's antidysenteric serum must be reserved. To obtain its good effects it must be given early. In 15 autopsies upon cases of Shiga colitis Howland found no characteristic anatomic changes. Nearly all varieties of inflammation except the croupous were encountered. Booker³ is of the opinion that his **Bacillus M**, described in 1889, appears identical with the bacillus of Duval and Bassett. The discussion was participated in by Flexner, W. H. Park, Koplik, Holt, J. H. M. Knox, and Booker.

Out of 64 consecutive cases of diarrhea in infants examined in the

¹ Roussky Vrach, vol. ii, No. 46.

² Rev. mens. des Mal. de l'Enf., July, 1903.

³ Arch. of Ped., Nov., 1903.

Vanderbilt Out-patient Clinic,¹ 62 showed the presence of the *Shiga bacillus* in the stools. All clinical types of diarrheal disease were to be found among the cases.

Nobécourt² finds that in children the *streptococcus* may induce a dyspeptic catarrhal type of diarrhea, infantile cholera, follicular enteritis, acute enterocolitis (Hutinel's dry cholera), or chronic gastroenteritis. Complications such as nephritis and cystitis with erythemas are not infrequent. Sanford Blum³ reports a case of "summer diarrhea" in which a streptococcus was found in pure cultures in the stools. Several other cases also showed a streptococcus in mixed culture. All the cases presented the same clinical type. There was remittent fever, marked general prostration, and the stools contained mucus and blood. A colleague of Blum's failed to obtain the agglutination test with cultures of the *Shiga bacillus* in like cases under his own observation.

Louis M. Warfield⁴ draws renewed attention to the **danger of contagion** in baby-wards during the prevalence of summer diarrhea. The discovery of *Bacillus dysenteriae* shows one cause for the contagiousness of these affections. Infection may be carried by the attendants, by the bottles, and by flies; methods for obviating such chances of infection may be summed up in the words "careful nursing" and "wire-screens or mosquito netting." The former should include isolation, so far as possible, and careful supervision of the milk, etc. In those cases of "summer complaint" in which there is profound shock with moist cool skin and semicoma, W. F. Waugh⁵ insists on the value of *atropin* pushed to the physiologic limit, followed by brucin, until the tonicity of the pulse has been reestablished.

E. Weill⁶ advises for the diarrhea of infants the use a 10 % aqueous **solution of gelatin** which has been filtered and sterilized at 120° C. If an autoclave is not available, the gelatin may be boiled for three-quarters of an hour. Ten cc. of the solution are then put in a test-tube, containing 1 gram of gelatin, which can be added, after warming, to the child's bottle. Six to 8 grams may thus be given daily, or, in case of need, 12 to 14 grams. It is best to begin with 3 grams a day and increase the dose by 1 gram daily. The frequency, odor, and appearance of the stools in acute gastroenteritis are soon altered for the better by gelatin treatment. Markedly toxic cases with bronchopneumonia, albuminuria, high fever, hepatomegaly, etc., do not respond so well, since the gelatin only modifies the stools without affecting the complications. In cholera infantum gelatin does not alter the character of the evacuations. Gelatin seems to act mechanically.

Combe⁷ discusses **intestinal autointoxication**, which he defines as a poisoning by toxic substances which develop in association with the vital processes of the organism, especially the quantitative and qualitative changes of normal digestion. Apart from suppuration, the ethereal

¹ Arch. of Ped., Mar., 1904.

² La Presse Méd., No. 76.

³ Arch. of Ped., Jan., 1904.

⁴ Med. Rec., Nov. 7, 1903.

⁵ N. Y. Med. Jour., July 18, 1903.

⁶ Rev. mens. des Mal. de l'Enf., 1904, vol. xxi.

⁷ Arch. de méd. des Enf., Jan. and Feb., 1904.

sulfates of the urine are derived entirely from intestinal putrefaction of the nitrogenous elements of the food and of the nuclealbumins of the bile, the pancreatic and intestinal secretions, and the intestinal mucus. Combe believes that the quantity of ethereal sulfates in the urine is proportional to the intensity of the putrefactive processes in the intestine. A diet composed principally of farinaceous food and moderate quantities of nitrogen is best calculated to reduce intestinal fermentation. In treatment Combe advises the avoidance of beef-tea, beef-juice, meat-jellies, white of egg, and pure milk, unless farinacea are mixed with them, and the giving of the largest quantities of starchy food possible. Enteroclysis, lavage, disinfection by small doses of calomel and castor oil, all find their uses; in grave cases hypodermatoclysis supplements them.

L. Guinon¹ calls attention to the **intolerance for cow's milk** often shown by children suffering from dyspepsia and chronic enteritis. These patients recover when milk is entirely eliminated from the diet for a short time and farinaceous food given in its place. If starchy foods are not well tolerated, kefir or buttermilk will be required. Kefir prepared from skimmed milk is best on account of its low fat-content.

The value of breast-milk in the dietetic treatment of dyspeptic atrophic infants is well known, but the fact that mother's milk is not a suitable diet for **acute inflammations of the digestive tract** is often ignored. Salge² tried to give breast-milk in 5 severe cases of acute enterocolitis, with irregular temperature-curve, toxic symptoms, adynamia, etc. The results were invariably disastrous and hastened the fatal course of the disease. It seems likely that the high fat-content of mother's milk was responsible for the sudden change for the worse.

From his **pathologic studies** of fatal cases of **gastrointestinal catarrh** C. E. Bloch³ concludes that we have to do in the acute and chronic gastroenteritis of infants with an inflammatory process in the intestinal mucosa which is most marked about the ileocecal valve. Marked pathologic changes extend only a short distance beyond the cecum into the small intestine, as a rule, whereas the inflammation in the large intestine is more evenly distributed. Exceptionally the duodenum may show mild inflammatory changes, but by far the larger part of the small intestine is free from marked pathologic change. The superficial epithelium and the glands in the small intestine are for the most part unaltered.

J. Zahorsky⁴ has found a relative increase in the polymorphonuclear cells, and a decrease in the lymphocytes in cases of **diarrhea** in infants. A very marked increase of the polynuclear cells indicates that the child is badly poisoned, whatever the other signs may indicate.

Eugene Schlesinger⁵ has studied the **condition of the blood in infantile atrophy and gastroenteritis**. The normal specific gravity of the blood between the second and the twelfth month of life ranges from 1048 to 1052, the number of red blood-corpuscles from $4\frac{1}{2}$ to $5\frac{1}{2}$

¹ Rev. mens. des Mal. de l'Enf., Mar., 1904.

² Jahrb. f. Kinderheilk., lviii.

³ Jahrb. f. Kinderheilk., 1903, lviii.

⁴ N. Y. Med. Jour., Sept. 12, 1903. ⁵ Arch. f. Kinderheilk., 1903, xxxvii.

millions, and the hemoglobin from 65 % to 90 %. In moderately severe cases of atrophy the number of erythrocytes may fall to, or a little below, the lower physiologic margin. The hemoglobin average is within the lower physiologic limit, and the specific gravity shows most clearly the dilution of the blood. In severe cases of atrophy the blood-count gives us figures within the physiologic limit, which, in the first months of life, are more apt to be high than low. The anemic condition of the blood is concealed by its concentration. In very severe cases of atrophy (not complicated by gastroenteritis) the number of red blood-corpuscles and the hemoglobin-content increase without exceeding the physiologic limit, while the specific gravity far exceeds the physiologic limit. In other words, the high grade of anemia is associated with highly concentrated blood. The severest cases often show a decidedly low specific gravity, with low counts of the red corpuscles and hemoglobin. A marked fall of the specific gravity with increasing atrophy is the herald of approaching death. In gastroenteritis the average values for the red blood-corpuscles and hemoglobin, and the specific gravity are considerably higher for the same loss in weight than in simple atrophy. Just before death we may find a sudden and marked fall in the number of red blood-corpuscles and the specific gravity. Neither in atrophy nor gastroenteritis do we find, as a rule, marked endoglobular changes in the red blood-corpuscles. The number of leukocytes in simple atrophy is normal or below normal, and the proportion of the different forms is also normal; exceptionally a moderate polynuclear leukocytosis is present, due to associated conditions, such as bronchitis, eczema, etc. On the other hand, the great majority of cases of gastroenteritis show a marked increase in the leukocytes, especially the lymphocytes, which is analogous to the lymphocytic leukocytosis produced experimentally in rabbits by the injection of *Bacillus coli*.

DISEASES OF THE RESPIRATORY TRACT.

W. Reynolds Wilson,¹ in discussing **disturbances of respiration** in the newborn, speaks of those passing attacks which result from alimentary disorders. Evidences of reflex irritation may be shown by prolonged attacks of drowsiness, promptly relieved by purgation, or by sudden nausea which shows itself in the form of syncope with respiratory failure. There may be a rise of temperature in such cases in advance of the digestive disturbance; and, at times, this may be mistaken for the fever of inanition described by Holt.

W. P. Northrup² relieved the dyspnea in a case of **pharyngeal croup** by nasal intubation with an ordinary firm-walled rubber drainage-tube 2 inches long. The dyspnea was caused by extreme swelling of the tonsils, uvula, and soft palate, with nasopharyngeal obstruction. The rationale consisted in introducing air behind the swollen velum and tonsils, and the method was markedly successful, enabling the child to obtain much-needed sleep and nourishment.

¹ Arch. of Ped., Sept., 1903.

² Arch. of Ped., July, 1903.

The fact is not generally recognized that **respiratory sounds** are **transmitted** and can be distinctly heard all over the abdomen in infants and very young children. All adventitious sounds, especially from the lower lobes of the lung and the lower and diaphragmatic portions of the pleuras, are also transmitted. Henry L. K. Shaw¹ also finds that the more distended the abdomen, the clearer are the transmitted sounds. These facts are probably accounted for by the loud and distinct character of infantile breath-sounds, the abdominal type of breathing, and the large size of the liver. The practical application lies especially in the early diagnosis of pneumonia of the lower lobes.

Leonard Findlay² calls attention to a method of **obtaining sputum** from young children which has long been in use in French hospitals. With a piece of gauze on the forefinger the epiglottis is irritated so as to induce coughing, and any sputum that is brought up is swept out of the mouth before it can be swallowed.

J. C. Gittings³ reports a case of **edema of the glottis** in a child of 5 years, occurring during convalescence from a mild attack of **scarlatina**. Suppurative cervical adenitis and the debility incident upon a long-standing Potts' disease were respectively the exciting and predisposing causes of the edema. Edema of the larynx (glottis) may be of two kinds: Simple edema, which occurs usually in the cachectic diseases, especially nephritis, and inflammatory edema, which results from contiguity to other inflamed structures, such as phlegmonous tonsillitis, or as a complication in acute infectious diseases, such as erysipelas, variola, etc. Traumatism, angioneurotic disorders, and such blood dyscrasias as scurvy and purpura, are rare causes of simple edema. J. H. Jopson considers that continuous inhalation of steam is of the greatest use in treatment, with the external application of moist heat. Tracheotomy may be imperatively needed, as intubation fails on account of the obstruction to the mouth of the tube from the swollen tissues.

Enlargement of the bronchial glands may be suspected in the combination of such signs as (1) enlargement of cutaneous veins over the upper part of the chest; (2) some deficiency of resonance over or on either side of the manubrium sterni, and (3) a venous hum in the same position when the head is retracted; especially if these occur in a delicate-looking child suffering from a cough for which no cause can be found, and from slight intermittent evening pyrexia. J. R. Clemens⁴ believes in the beneficial effects of open-air life, sound food, and iodid of iron and arsenic in these cases.

In regard to the frequency of **bronchiectasis** in children M. O. Lapin,⁵ of Moscow, finds reports of 10 cases in the St. Olga Hospital. He considers the disease not uncommon; its cause, simultaneous disease of the lungs and bronchi, followed by sclerosis. The sclerosis causes dilation of the diseased bronchial walls. Pneumonia without sclerosis does not lead to bronchiectasis. Measles, influenza, pertussis, and syphilis are the

¹ Arch. of Ped., 1903.

² N. Y. Med. Jour., July 25, 1903.

³ Arch. f. Kinderheilk., 1903, xxxvii.

⁴ Arch. of Ped., Feb., 1904.

⁵ Med. News, Dec. 12, 1903.

most frequent infections which give rise to dilation of the bronchi following bronchopneumonia. Acute bronchopneumonias are accompanied by acute bronchiectases. The latter disappear when the disease giving rise to them ceases. The symptoms of bronchiectasis are similar to those in adults, but the characteristic expectoration is usually absent in young children. There is seldom fever except during exacerbations of the bronchitis. Dyspnea is seldom marked; the breath is usually fetid. Hemoptysis occurred in 6 out of 12 cases, possibly due to the rupture of small aneurysms. Clubbing of the fingers is characteristic of this disease. The physical signs do not differ from those found in adults. The lower lobes or the whole lung may be affected; the upper lobe is exceptionally the seat of this disease unless it is a complication of tuberculosis. The general health for a long time remains unaltered, but the prognosis is very unfavorable. It is noteworthy that bronchiectasis is seldom complicated by tuberculosis.

Theodore Fisher¹ details 4 cases of **bronchiectasis** following **measles**. One case in an infant 18 months old, in which the diagnosis was made antemortem, gave a history of constant cough for a year following the attack of measles. There were a somewhat dull percussion-note over both lower lobes, marked bronchial breathing, the characteristic clubbing of the finger-nails, and offensive breath.

M. Nicoll, Jr.,² divides the **pneumonias** of children, as they are met at autopsy, into 3 varieties, exclusive of tuberculosis: (1) **Hypostatic**, the pneumonia of the marantic, those wasted by chronic disease in which the heart weakens. (2) **Bronchopneumonia**, the disease of the more resistant child, who is still handicapped by reason of youthful age, poor hygienic surroundings, improper food, or previous illness. (3) **Lobar pneumonia**, the disease of the most resistant child, usually over 3 years of age, who is noncatarrhal, nonrachitic, rarely an inmate of a tenement-house or institution—the primary benign pneumonia. He analyzes 167 cases of the so-called primary bronchopneumonia from the records of the New York Foundling Hospital since 1901. Many of these cases were probably secondary to overlooked disease of the upper air-passages. Especial stress must be laid on the disturbance of the pulse-respiration rate in the diagnosis. Physical signs may be negative at the most; cough may be absent, and, in children of low vitality the disease may run its course practically without fever. No disease is more irregular in its course or uncertain in its outcome. In any case of sudden and grave illness in a child under 3, bronchopneumonia should always be considered. In the **treatment** of the disease, W. P. Northrup³ considers the following basic principles: Fresh air and fresh, cool drinking-water in abundance; quiet, rest, undisturbed sleep, tranquillity of surroundings; free evacuation of the bowels at the onset, preferably by castor-oil; an easily digestible, nonfermentable diet; cool sponging or other hydrotherapeutic measures for hyperpyrexia, but not at the expense of worrying the child; a cool wet cloth to the head is better than an ice-bag, and frequent gentle

¹ Lancet, Oct. 31, 1903.

² Ibid.

³ Med. News, Apr. 30, 1904.

sponging of the face and wrists and wetting of the lips add to its comfort. Instead of employing heart-stimulants, search should be made for an additional cause for embarrassment of the heart, such as tympanites or poor peripheral circulation. Hot foot-baths and hot, high enemas often relieve an overworked heart. Of drugs, whisky and strychnin are advisable, if urgently indicated.

David Bovaird, Jr.,¹ discusses the **pathology of lobar and bronchopneumonia**. The latter was found in 40 % of 500 autopsies at the New York Foundling Hospital. The lesions in both forms present essentially the same picture as in adult life. The frequency of empyema in infancy Bovaird has previously alluded to. (YEAR-BOOK, 1904, p. 276.) The pneumococcus is the causative agent in 95 % of cases of lobar pneumonia (Aufrecht); and in primary cases of bronchopneumonia it is likely to be found. In 50 % or more of all cases of pneumonia the pneumococcus is present, although the infection is apt to be mixed with the organism of the primary disease and with the streptococcus, staphylococcus, or Friedländer's bacillus. Rosenau has found 77 instances of pneumococcal infection of the blood in 83 cases of lobar pneumonia. The occurrence of these infections in primary cases of bronchopneumonia has not been definitely proved.

A. Kühn² reports a most unusual termination of croupous pneumonia, after an illness of 5 weeks, in the formation of a **sequestrum** from hepatized tissue. The sequestered mass was found in a cavity in the upper half of the left lung. Its surface was uneven and its consistence elastic. It measured 3 cm. in length and 1 cm. in thickness. The cavity, which extended from the apex to the base of the lobe, showed a smooth wall with irregular projections of hepatized lung tissue. Henoch has reported a similar case.

John Lovett Morse,³ in a series of 8 cases of pneumonia treated with **antipneumococcic serum**, found that the remedy had no effect on the duration of the disease, the course of the temperature, the rate of the pulse, or the progress of the local condition. Complications were at least as frequent as usual and the death-rate was unusually high. On the other hand, no harmful effects were observed.

J. P. Crozer Griffith⁴ details several examples of a well-recognized, long-known, but frequently forgotten tendency for patients with **pneumonia** or **pleurisy** to refer their pain to the **abdomen**. This is especially true in early life, and numerous instances have been recorded of a mistaken diagnosis of appendicitis for pneumonia or pleurisy. The distinction is to be made by giving due consideration to (1) the sudden rise of temperature to 103° F. or thereabouts, which is usually maintained; (2) the acceleration of respiration, which is out of proportion to the pulse-rate or the pyrexia; (3) the relaxation of the abdominal walls between the respirations; (4) the diminution or disappearance of tenderness on deep pressure with the flat of the hand; (5) the possible presence of cough. Finally, no operation for appendicitis should ever be per-

¹ Med. News, Apr. 30, 1904.

² Arch. f. Kinderheilk., 1904, vol. xxxviii.

³ Arch. of Ped., July, 1903.

⁴ Jour. Am. Med. Assoc., Aug. 29, 1903.

formed without a careful, and perhaps repeated, examination of the lungs. All these points may, however, fail to make the diagnosis certain.

From the results of microscopic examination of the pleural exudate and cultures in 73 cases of **idiopathic pleurisy** produced by experimental inoculations into animals, F. Nathan¹ concludes that an **etiologic relationship between tuberculosis and serous pleurisy in childhood** exists only for a small minority of cases. This seems to confirm Baginsky's view that pleurisy in children stands by no means in such close relationship to tuberculosis as has been assumed by many authors who are impressed by the great extent of tubercular disease among children.

J. L. Morse² draws attention to certain points in the **diagnosis of metapneumonic empyema** in early life. Persistence of fever and other symptoms after the time of expected crisis, or their recurrence after the crisis, should always suggest the possibility of empyema. Rapid emaciation and progressive pallor are the most constant symptoms in neglected cases, while chills and sweating are unusual. Enlargement of the affected side as a whole is more common than flattening or bulging of the intercostal spaces. The most constant and characteristic sign of effusion is a marked sense of resistance over the fluid. Next to this in importance is [recent] displacement of the heart. These two signs justify the diagnosis of effusion. Dulness or flatness may be replaced by tympany (probably transmitted from the abdominal cavity). The breath-sounds are usually of bronchial quality and diminished in intensity, but may be loud. Vocal resonance is of uncertain value; the absence of vocal fremitus is an important sign, but difficult to determine. Rales may be transmitted through large amounts of fluid.

Oscar Mercier³ reports a case of **empyema** which ruptured spontaneously through an intercostal space; at the same time there was a profuse expectoration of purulent material from the mouth. Six months later food was detected in the discharge from the fistula. The pus had in some way effected an entrance into the stomach, probably near the cardia. Resection of a rib and drainage were followed by spontaneous closure of the gastric opening.

Raoul Labbé⁴ records a case of left-sided **empyema** in an infant 6 weeks old.

The occurrence of **pneumothorax** among children is extremely rare. David Bovaird, Jr.,⁵ has collected 18 cases from the literature of the past 10 years, including 5 cases from his own personal knowledge. Only 4 of the 18 cases recovered. In children pneumothorax seems most liable to occur in the diseases which are characterized by their tendency to bronchitis, bronchiectasis, and bronchopneumonia; namely, measles, diphtheria, and whooping-cough. Its occurrence with tuberculosis is less frequent than is the case in the adult. For the relief of pressure-symptoms aspiration of the air from the pleural cavity or even free incision may be advisable.

¹ Arch. f. Kinderheilk., vol. xxxviii, Hefte 3 u. 4.

² Amer. Med., Mar. 12, 1904.

³ L'Union Méd. du Can., Dec.,

⁴ La Ped. Pratique, Oct. 15, 1903. ⁵ Arch. of Ped., Nov., 1903.

Samuel S. Adams¹ reports a case of **multiple abscess of one lung** closely simulating **pyothorax**.

L. E. Holt² reports 2 cases of **abscess of the lung** following acute pneumonia in children. The chief difficulty in diagnosis lies in distinguishing a sacculated empyema or a delayed resolution from intrapulmonary abscess. The percussion-note, the voice, and the breath-sounds are practically identical in empyema and abscess of the lung. The presence of pleural friction-sounds would count against empyema, as would the difficulty of finding pus with the needle. Displacement of the heart would count for empyema unless the abscess of the lung were of large size. Breathing and voice sounds over an abscess are feeble or absent, while over an unresolved pneumonia they are usually bronchial in character, although sometimes feeble in intensity. On the other hand, an abscess may exist in the center of an unresolved pneumonic area. A continuous fever and high leukocytic count point strongly to the presence of pus, in contradistinction to a simple unresolved pneumonia. In tuberculosis the diagnosis may be impossible without a prolonged period of observation. Wasting is a less frequent symptom in simple abscess. Both of Holt's cases recovered—the one after aspiration and the other after drainage.

The occurrence of **congenital cysts** of the left lung with associated dextrocardia from displacement is reported by George Carpenter.³ The cavities varied in size up to a small orange, the larger one being empty, while some of the smaller were filled with granular material. No connection with a bronchus could be found, the main bronchial tube leading directly to a small area of normal lung tissue. Another case of congenital cystic degeneration of the lung is reported by A. Convelaire.⁴ It involved the middle lobe on the right side and filled the whole right half of the thorax. The right upper and lower lobes were atelectatic for the most part. The heart was large, the right ventricle markedly hypertrophied. Histologically the lung showed adenomatous nodules alongside of the large cystic cavities, resembling in structure the fetal lung. The infant died on the sixth day. Balzer and Grandhomme have reported an instance of chronic bronchopneumonia with sclerosis, malformation, and beginning bronchiectasis in a newborn infant, while Grawitz believes that congenital bronchiectasis is sometimes compatible with life, for a short time at least.

DISEASES OF THE HEART AND BLOODVESSELS.

Bertrand Zuber⁵ describes an unusual case of marked **congenital dilation** of the whole **pulmonary artery** in an infant of 5 months.

Walter Broadbent⁶ reports a case of **congenital heart lesion**. The girl, aged 13 years, gave a history of mild cyanosis during the last 7 years.

¹ Arch. of Ped., Nov., 1903.

² Arch. of Ped., Jan., 1904.

³ Brit. Jour. Child. Dis., Apr., 1904.

⁴ Rev. mens. des Mal. de l'Enf., Feb., 1904.

⁵ Jahrb. f. Kinderheilk., vol. lix.

⁶ Lancet, Nov. 14, 1903.

A high-pitched, blowing systolic murmur transmitted to the left was heard over the pulmonic area and a much accentuated reduplicated second sound. The area of dulness was increased to the right and left. The murmur was not affected by deep breathing. The entrance of air was diminished over the left lung. Dyspnea was marked on the slightest exertion. The cyanosis disappeared when the child was put to bed, and did not reappear when she began to move about, 2 months later. The murmur had almost disappeared by this time. The case may be explained by a patent foramen ovale—a condition which may not cause any symptoms until some disease of the lungs raises the pressure on the right side of the heart. Lack of expansion of the lung which uncovered the pulmonary artery, or patency of the ductus arteriosus, as well as of the foramen ovale, are also possible explanations.

J. M. Cowan and A. R. Ferguson¹ are convinced that the large majority of cases of **congenital heart-disease** are due to **maldevelopment** of the various septums or of the valve cusps. The occurrence of endocarditis during intrauterine life must be admitted, but the most weighty argument against the possibility of its causing defects in the septums lies in the fact that the formation of the latter is completed during the seventh or eighth week of fetal life, so that endocarditis, to produce its malformation, must occur within one particular fortnight. Again, the proximity of the pulmonary artery to the aorta is such that an inflammatory process affecting the one would certainly affect the other also.

The subject of **displacement of the heart's apex** under **physiologic** conditions is considered by Eugene Terrien and Louis Lamy.² To obtain the best results one should study the change in position of the apex when the child is lying alternately on the right and the left side. In the left lateral posture the lateral deviation is marked, 18 to 22 mm., the downward deviation slight, 5 mm., at the age of 5 years. At 7 years the lowering of the apex is 14 mm., and the lateral deviation 22 mm. on the average; from 12 to 15 years lateral deviation 30 mm. and downward 20 to 25 mm.

Among the measures for combating the **effects of carditis** in children, A. Morrison³ believes that opium should have a prominent place, and emphasizes the capacity of children for tolerating considerable doses of the drug under suitable circumstances.

J. A. Coutts⁴ reports a case of **purulent pericarditis** of 17 weeks' duration. It was apparently a primary and solitary pneumococcic infection, with no history of any preceding illness. The area of dulness extended from the supraclavicular fossa into the area of heart dulness, and from the left anterior axillary line to the right border of the sternum. At autopsy this was explained by the immense distention of the pericardium, enlargement of the heart, displacement of the apex of the left lung. The case had been diagnosed as empyema. The distinct apex-beat, the comparative clearness of the sounds, the absence of distress, and, above all, the rapidity of the disease seemed to exclude purulent pericarditis.

¹ *Lancet*, Oct. 3, 1909

² *Pediatrics*, vol. xv,

⁴ *Brit. Med. Jour.*, A

A case of **hemorrhagic pericarditis** following **pleuropneumonia** reported by William Stewart.¹ Recovery followed aspiration. A pure growth of *Bacillus coli communis* was obtained from the aspirated fluid.

J. L. Morse² records a remarkable case of **hemopericardium** in a child 2½ years old caused by a needle which was accidentally forced into the chest near the right edge of the sternum and broken off. No symptoms followed the accident until after 2 weeks. The child then began to appear sick, without definite symptoms except dyspnea. Physical examination revealed an enlarged area of cardiac dullness, but the other signs of fluid were inconclusive. The fluoroscopic picture was characteristic of pericardial effusion, however. Through puncture in the sixth interspace, 9.5 cm. to the left of the median line, 500 cc. of a dark bloody fluid were withdrawn. The needle was seen by fluoroscope, but permission to remove it was not obtained. Complete relief followed the tapping, and the child left the hospital apparently well. The needle evidently did not at once injure the pericardium, but later worked its way to it. Subsequently it probably became encapsulated.

DISEASES OF THE BLOOD.

Anna Perlin³ gives the results of her extensive investigations to determine the **physiologic variations** in the **hemoglobin** content and number of blood-corpuscles during infancy and childhood. In the newborn the hemoglobin content is highest during the first 3 days of life (116 % to 119 %), then falls, so that a minimum is reached during the first year (58 % to 78 %); from the second to the fifteenth year the hemoglobin content rises steadily (at 16 years, 74 % to 88 %). In the fourth year it does not fall below 70 %. The number of red corpuscles is highest in the first week of life (5,280,000 to 7,550,000), then lessens, and is at its lowest during the first year (4,200,000 to 5,300,000). By the fourth year the number of red cells has risen somewhat (4,750,000 to 5,600,000) and remains at this level to the eighth year; from the eighth to the sixteenth year there is a continual rise (at 16 years, 4,800,000 to 6,000,000). The number of white cells is greatest in the first 2 days of life (15,800 to 19,000), then falls by the fourth year (8240 to 13,400), remains at about the same level to the eighth year (7800 to 13,400), then falls rapidly to the sixteenth year (7000 to 9220).

Robert Hutchinson⁴ finds that the comparative **poverty in hemoglobin** is one of the most striking characteristics of the blood in **childhood**. The marked preponderance of the red marrow at this period of life is also noteworthy, since it indicates that there can be no reserve power of formation, as there is in the adult. This may explain why children are apt to become anemic on slight provocation. He estimates that the leukocytes at birth number approximately 20,000; of these, 15,000 are polynuclear

¹ Edinb. Med. Jour., Feb., 1904.

² Boston M. and S. Jour., Mar. 3, 1904.

³ Jahrb. f. Kinderheilk., 1903, lviii.

⁴ Lancet, May 7 and 14, 1904.

(granular) and 5000 mononuclear (nongranular) cells. At the end of the first week the total number of white cells is about 10,000, 5000 being of each variety. A second rise then sets in to an average, in the sixth month, of 15,000 cells, of which the polynuclear number 5000 and the mononuclear, chiefly lymphocytes, number 10,000. A gradual fall then takes place, reaching normal about the sixth year. It will be seen that after the first week the number of polynuclear cells remains quite constant—i. e., 5000 per cubic centimeter. The origin of leukocytes is attributed by Wolff to a parent "lymphoid" cell which is almost identical with the large lymphocyte and is the first to appear in fetal blood. The preponderance of mononuclear over polynuclear cells in infancy indicates an unusual degree of **activity of adenoid tissue**. The function of the mononuclear cell is not determined. We know that it plays a minor part, if any, in the defensive mechanism of the organism. Even in earliest childhood infectious disease is attended by a purely polynuclear leukocytosis; much evidence favors the view that the mononuclear cell plays a part in nutrition, possibly by aiding absorption. Undoubtedly impaired nutrition in infancy is accompanied by an exaggeration of the normal activity of adenoid tissue, manifest by an overdevelopment of such organs as the thymus, spleen, and tonsils, and by the presence of an excess of lymphocytes. Normally the decline in the number of these cells coincides with the decline in the activity of the thymus, but the lymphocytosis may persist beyond this period. Presumably, in these cases, the involution of the thymus is also delayed, and such occurrence is marked by delicacy of health. In the blood disorders of infancy as a whole affections of the adenoid tissue predominate, while, in contrast to adult life, especial involvement of the bone-marrow is rare. Thus, **pernicious anemia** and **myelogenous leukemia** are rarely seen; while hypertrophies of adenoid tissue and lymphadenoma, lymphosarcoma, and **lymphatic leukemia** are comparatively frequent. Examples of the **chlorotic type of anemia** are seen in infancy and cannot always be differentiated from secondary anemia associated with rickets. The normal deficiency of hemoglobin must not be forgotten, and it is possible that certain factors increase this tendency, such as a deficiency of iron in the diet. This may be seen in infants fed at the breast for a protracted period, or in those who receive an insufficient supply of the proper animal food. The striking improvement in such cases when they are put on a diet rich in iron, and especially when the salts of iron are administered, is suggestive. The rarity of pernicious anemia in infancy is impossible to explain, for deleterious influences of various sorts easily produce a blood deterioration at this age. The **secondary anemias** are apt, too, to assume a severe type and may present a picture which in the adult would justify a diagnosis of pernicious anemia. Poikilocytosis and nucleated red cells often appear in the blood of secondary anemia in infancy. In the severest forms leukocytosis is apt to occur with splenic enlargement, it seems to be chiefly with chronic gastrointestinal disturbance the

occur. Destructive influences leading to **secondary anemia** are also seen in the acute infectious diseases, particularly **rheumatism** and **diphtheria**. In all of the secondary anemias of childhood, however, there is **no characteristic type** of blood. **Splenic anemia** in children usually occurs between the sixth and twenty-fourth month of life, wasting is generally present, and rickets is almost invariably found. There seems to be a family tendency to the disease. In 50 % of Hutchinson's cases congenital syphilis could be excluded, and tuberculosis played no part in its etiology. The disease is of shorter duration than in adult life and by no means progressively fatal, recovery being seen in a considerable proportion of cases. The changes in the spleen consist of a **chronic splenitis** affecting principally the pulp, but the extent of these changes and the degree of anemia seem to bear no definite relation to each other. The red marrow is abundant and shows great evidence of cellular changes. The liver and lymphatic glands show no characteristic changes. Hutchinson is inclined to put the disease into a separate category, although admitting the difficulty of sharp differentiation from cases of secondary anemia. He deprecates the use of the term "anæmia pseudoleukæmia infantum," proposed by von Jaksch, preferring the term "splenic anæmia infantum." It seems probable that the enlarged spleen and the anemia are both the result of one common cause, possibly toxic in nature. Pure myelogenous leukemia is extremely rare in infancy; the fact of the comparative frequency of the lymphatic form may be correlated with that of the great extent and activity of adenoid tissue in childhood. Hutchinson believes that in the future we will speak of a lymphocytic, myelocytic, or a mixed-cell leukemia rather than of a myelogenous or lymphatic.

Clive Riviere¹ believes that anemia from any cause in infancy, if severe enough, gives rise to the peculiar symptoms grouped under the headings "anæmia splenica infantum" and "anæmia splenica pseudoleukæmia" of von Jaksch; that they are not specific blood-diseases, but owe their peculiarities to the "infancy factor," and that they represent merely different stages of the same condition; that the common cause of severe anemia in infants is gastrointestinal catarrh leading to the absorption of toxins from bacterial growth or possibly from the poisonous by-products of digestion; that leukemia of infants is not a separate disease, but merely a still more advanced stage of this anemia, and that leukemia of adults is a return to the condition of infantile anemia, and that, being rare, its causation is probably so narrowed down as to be practically specific.

George Carpenter² concludes that two important conditions of ill health are frequently associated with splenomegaly in early life—syphilis and rickets. There is also an undetermined cause or causes. Intestinal auto-intoxication, in the absence of other causes for ill health, may well be held responsible for splenomegaly. That continued intestinal disturbances in infants are provocative of rickets is undoubted, but the association ends there, for the poison which produces rickets does not appear to be the same as that which produces splenomegaly or that

¹ Lancet, Nov. 21, 1903.

² Brit. Med. Jour., Aug. 29, 1903.

which produces anemia. From this group it is sometimes difficult to exclude syphilis. Aside from the fact that an enlarged spleen appearing during the first 6 months of life, even when taken alone, is very suggestive of syphilis, Carpenter believes that its importance lies in the associated condition of the blood; upon the degree of anemia, the changes in the red cells, and the extent of the leukocytosis depends the prognosis.

Senator¹ considers that **Banti's disease** is a second stage of splenic anemia. In many cases of this affection swelling of the thyroid, the suprarenals, and the intestinal follicles has been reported, and in Senator's experience there is constant involvement of the mesenteric glands, from which we may infer that toxins may have entered the circulation from the intestinal tract.

Max Mosse and David Grünbaum² report a probable case of **pernicious anemia** in a child 10 months old. The progress of this case to a fatal termination, the marked alteration of the red blood-cells (microcytes, macrocytes, megaloblasts, and gigantoblasts), the distinct increase in the number of leukocytes, the presence of myelocytes, the absence of splenomegaly and enlarged liver—all together speak in favor of this diagnosis. Karyokinetic changes in the leukocytes were observed shortly before death.

Pietro D'Orlandi³ notes marked improvement in a case of **splenic anemia** treated with a freshly prepared extract of calves' spleen.

Charles H. Dunn⁴ (Boston) has made a large number of observations on the **iodin reaction in the blood** of children. The reaction was always present, of average or marked intensity, in lobar pneumonia, bronchopneumonia, cerebrospinal meningitis, influenza, empyema, suppuration (nontubercular), and in one case each of appendicitis, diphtheria, and starvation. S. Weiss⁵ has found it only in severe cases of the laryngeal and pharyngeal forms of diphtheria. The reaction was usually present in cases of typhoid fever and miliary tuberculosis, was usually absent in nephritis, cardiac valvular disease, and tuberculosis, and was absent in pleurisy with effusion, functional indigestion, rachitis, articular rheumatism, congenital cardiac disease, chorea, infantile atrophy, and in one case each of bronchitis, eczema, purpura, urticaria, and scorbutus.

E. Fromherz⁶ and I. S. Weil,⁷ in separate articles, state their belief that the **polycythemia of congenital heart-disease** is in the nature of a **compensatory change**. Since the amount of blood flowing through the lungs is less than normal, only by such an increase in the number of red cells can a sufficient amount of oxygen be secured for the tissues.

CONSTITUTIONAL DISEASES.

Arnold Lorand⁸ finds that in the majority of cases the **children of diabetic persons** inherit a certain defective power of dealing with

¹ Arch. f. Kinderheilk., 1904, vol. xxxviii.

² Jahrb. f. Kinderheilk., 1903, vol. lviii.

³ Boston M. and S. Jour., Nov. 5, 1903.

⁴ Münch. med. Woch., Oct. 6, 1903.

⁵ Practitioner, Oct., 1903.

⁶ La Pediatria, vol. x, No. 7.

⁷ Jahrb. f. Kinderheilk., vol. lix.

⁸ Arch. of Ped., May, 1904.

sugar in their economy. He has succeeded in producing an alimentary glycosuria *ex amylo* in such children by feeding them test-meals containing a large proportion of starch. Other symptoms Lorand has noted in these children are a tendency to acne vulgaris and furunculosis, obesity, gingivitis, alveolar pyorrhea, and atrophy of the gums. It has been observed that a diet rich in meat and in sweet and amylaceous foods is liable to lead to diabetes mellitus, and it is well known that great intellectual strains and psychic emotions may precipitate the disease. Lorand believes therefore that our prophylaxis for predisposed persons should begin in early life, and that we should attempt to supervise the psychic education as well as the diet of these children.

Edward L. Pierson¹ has found **diacetic acid** in the urine either just preceding or in the early stages of an attack in 3 cases of **recurrent vomiting** in children. Large doses of bicarbonate of soda (100 to 125 grains a day) either prevented or rapidly ameliorated the symptoms. Pierson finds that fats, except as fresh butter, are not well tolerated in the diet in these cases, and that a too large predominance of carbohydrates also leads to the digestive changes which favor the production of the acid.

A **fatal case of cyclic vomiting** is reported by Julian Smith.² The patient, a boy of 5½ years, came of neurotic stock. Fifteen previous attacks were recorded, each varying from 3 to 7 days in duration. Death occurred on the seventh day of the reported attack.

Leignen and Mirallée³ report a case of uncontrollable vomiting in a child of 9 years, lasting 9 days and followed on the fifteenth by definite signs of **meningitis**. During the period of vomiting the urine contained acetone.

Primary acute polymyositis is a rare disease in childhood. Arthur Schüller⁴ observed a case in a boy 7 years old, beginning suddenly with a short febrile stage, followed by painful muscular rigidity involving practically the whole body, and persisting for several weeks. Five similar cases have been reported. Three clinical types of this disease can be differentiated: (1) Polymyositis simplex. (2) Neuromyositis. (3) Dermatomyositis. Schüller considers slow contraction of the muscles to the direct faradic current a valuable sign of the purely myogenic nature of the contractures.

D. L. Edsall⁵ reports an example of **Still's type of chronic polyarthritis** in a boy of 13 years. In this case Edsall's observations led him to believe that the condition is probably a peculiar form of chronic widespread **tuberculosis** of the joints. The tuberculin test twice gave a decided reaction, and in an emulsion made from the lymph-nodes removed from the axilla a large number of acid-fast bacilli of typical appearance were found. Inoculation experiments with this emulsion proved negative, which was probably due to the fact that the bacilli were either dead or of low virulence.

¹ Arch. of Ped., July, 1903.

² Intercol. Med. Jour. of Australas., Jan. 20, 1904.

³ Gaz. Méd. de Nantes, Aug. 15, 1903.

⁴ Jahrb. f. Kinderheilk., lxx.

⁵ Arch. of Ped., March, 1904.

Fairbanks¹ has collected 168 cases of "idiopathic" or "essential" dropsies of childhood; 83 % were in children under 8 years of age. The characteristic feature of this condition is edema in one or more parts of the body, without albuminuria or sedimentary evidence of organic disease of the kidneys; without clinical or postmortem evidence of organic disease of the heart and kidneys. Nearly half the patients suffered from gastrointestinal trouble, generally diarrhea, one-fourth were anemic, and one-seventh had subnormal temperatures. Edema in the course of or following infectious diseases is not included in this series of cases. The mortality in infants was 34 %, due in some cases to intercurrent disease. Fairbanks thinks that in the great majority of cases essential dropsy is produced by a reflex disturbance of the sympathetic nervous system originating in a direct "exciting cause." This may alone evolve such reflex, but usually there is a predisposing condition; for example, anemia, marasmus, including subnormal temperature, and heredity. As exciting causes we may consider toxic; chemic; extremes of temperature, especially cold; trauma; peripheral irritation and psychic disturbance.

DISEASES OF THE DUCTLESS GLANDS, DEVELOPMENT, AND NUTRITION.

George Blumer² concludes that the condition known as **status lymphaticus** is a definite pathologic entity; that it is probably associated with, if not due to, a condition of intermittent **lymphotoxemia**; that it may be associated with sudden death, probably as a result of such toxemia in some cases or as a result of toxic, physical, or psychic injuries which are augmented by the predisposing action of the lymphotoxemia; sudden death may be due to asphyxia from pressure of the enlarged thymus on the trachea. From Escherich's description it may be possible to recognize a distinct clinical type of these patients. He states that they have a pale skin, a pasty complexion, and a good pad of subcutaneous fat; their superficial lymph-nodes, especially the cervical and axillary, and their tonsils and pharyngeal lymph-nodes are hypertrophied; the spleen is often palpable; signs of rachitis are frequently present; demonstrable enlargement of the thymus gland may sometimes be noted. [We are in accord with this, excepting the view that sudden death may result from pressure on the trachea.]

From a study of the **thymus glands** in a series of 15 fetuses of various periods of development E. Mensi³ concludes that the corpuscles of Hassal are essential factors in the functional activity of the gland and that they are products of proliferative activity in the gland itself.

In the Pediatric Section of the Society of German Naturalists, Hochsinger⁴ asserted that **congenital laryngeal stridor** depends on **hypertrophy of the thymus gland**. The röntgen-ray pictures demonstrated

¹ Méd. Moderne, 1903, p. 336; Am. Jour. Med. Sci., Sept., 1903.

² Johns Hopkins Hosp. Bull., Oct., 1903.

³ La Pediatria, vol. xi, No. 2.

⁴ Jahrb. f. Kinderheilk., 1903, lviii.

decided enlargement of the thymus gland in the 24 cases examined. Teixeira de Mattos, Ganghofner, and Siegert combated this view. The röntgen rays do not afford positive proof of enlarged thymus, nor is the causal relationship of hypertrophied thymus to congenital stridor demonstrated, since the two conditions are often not coëxistent.

Luis Agote¹ (Buenos Aires) emphasizes the importance of recognizing the early signs of **congenital myxedema**, which are, in order of their appearance: false umbilical hernia, low temperature, and constipation; next irregular gain in weight, hard edema, and hypertrophy of the tongue with guttural voice. These indications may all be present to a greater or less degree before the sixth month of life, and should enable the physician to institute thyroid gland treatment at an early stage of the disease. The results of thyroid treatment will confirm the diagnosis, should the latter be in doubt, and prevent the severest manifestations of congenital myxedema.

Alfred Gordon² reports 2 cases in brothers of **myxedema** complicated by genuine **diabetes mellitus**. They were the offspring of neuropathic parents with degenerative tendencies. Thyroid extract in both patients showed a very favorable influence upon both conditions—even earlier on the diabetes than on the myxedema.

Haushalter and Richon³ observed 2 interesting cases of **lymphadenitis**, both in boys 10 years old. The first patient had passed through a mild attack of serous pleurisy at 4 years of age. Five years later he had a pustular eruption on his face, followed by enlargement of the cervical glands, failure of health, and cough. At the end of one year he was admitted to the hospital with general adenopathy and extreme anemia, death resulting in one month from bronchopneumonia. The autopsy showed general hypertrophy of the blood-making organs with lymphomatous changes in liver, stomach, and intestine, sclerotic changes in the lymph-glands, and areas of fatty degeneration in the liver and of cellular proliferation in the bone-marrow. The red blood-corpuscles varied from 589,000 to 1,457,000 and the white cells from 1500 to 1860. A differential count showed polynuclears 90.4 %, eosinophiles 2.4 %, mononuclears 7.2 %, and 12.5 % nucleated red cells (for 100 whites). The mesenteric, bronchial, and cervical glands were decidedly enlarged. There were a few miliary tubercles at the apex of the left lung, and one minute cavity. In spite of the presence of tubercular lesions and the antecedent pleurisy, the authors do not consider the adenitis to have been tubercular, since no caseous foci, tubercle bacilli, or giant cells were found in any of the glands. The second patient showed signs of mediastinal tumor with marked anemia, slight leukocytosis, and circulatory disturbances produced by compression. This was probably **lymphosarcoma**. No autopsy was allowed.

From a study of the condition of **congenital megacolon** (giant-colon) F. Valagussa⁴ believes that it is due to abnormal embryonic evolution, especially in the connective-tissue elements; the muscular hypertrophy

¹ Arch. de méd. des Enf., Sept., 1903.

² Amer. Med., Feb. 6, 1904.

³ Arch. de méd. des Enf., May, 1904.

⁴ Riv. di Clin. Ped., Dec., 1903.

has only in small degree a functional origin and consists in myopathy of the fibers.

Irving M. Snow¹ classifies the causes of the **mortality of the first 4 weeks of life** as follows: (1) Immaturity; (2) malformations incompatible with life; (3) asphyxia and atelectasis; (4) injuries of parturition; (5) various infections. In the earlier days deaths are principally due to one or more of the first 4 divisions; after the first week infections cause the majority of fatalities. Asphyxia and intracranial hemorrhage are closely associated. Both result from the same cause—dystocia. Hemorrhage may occur in small children who are born easily. Death may occur suddenly without symptoms or there may be irregular respiration with slight cyanosis, simulating asphyxia or atelectasis. It is probable that many cases of intracranial hemorrhage are thus unrecognized. Usually, however, following a difficult labor, when convulsions, irregular breathing, and cyanosis supervene, the diagnosis may be made with great accuracy. Death usually occurs before the fourth day. The slight hemorrhage, without symptoms, may later give rise to a variety of conditions, such as idiocy, epilepsy, diplegia, hemiplegia, etc. The general clinical picture of infection consists of fever, cyanosis, rapid breathing, convulsions, vomiting, and diarrhea. A premature infant may, however, have no rise in temperature.

On the basis of over 3000 observations on the **daily variations in temperature during infancy and childhood**, Tundell² finds that the fluctuations in temperature in healthy, well-nourished children are not as great as it has been customary to consider them.

In late childhood and adolescence, says Jules Comby,³ we often see a mild osteitis in rapidly growing subjects, affecting most frequently the **epiphyses**. The anterosuperior tuberosity of the tibia is usually the seat of this disease, which is characterized by pain (increased on exertion) and a long course, with eventual recovery. Comby advises rest in bed for one or two weeks, counterirritation, good food, tonics, and the avoidance of fatigue.

T. M. Rotch and C. H. Dunn⁴ report a well-marked case of **pulmonary osteoarthropathy** in a boy 3 years 7 months of age. He had been a healthy breast-fed baby and had had measles and pertussis. When first seen, there had been a cough of moderate severity for a year. On examination, he was found to be well nourished. The entire left lung was consolidated; this was confirmed by the radiograph. The sputum contained cocci and Pfeiffer's bacilli. The tuberculin test was twice found to be negative. A differential leukocytic count showed: polymorphonuclear cells, 68 %; large basophiles, 4.8 %; small basophiles, 23 %; eosinophiles, 2.6 %; mast cells, 1 %; myelocytes, 0.4 %. No erythroblasts were seen. There was marked enlargement of the tips of the fingers of both hands; to a less extent, in the distal phalanges of the great toes. The radiograph showed that the enlargement involved primarily the bone itself.

¹ Arch. of Ped., Sept., 1903.

² Jahrb. f. Kinderheilk., vol. lix, Heft 5.

³ Arch. de méd. des Enf., Sept., 1903.

⁴ Arch. of Ped., Oct., 1903.

F. Michel¹ reports a case of **osteogenesis imperfecta**, but can add nothing to our knowledge of the etiology of this affection.

C. Bloch² discusses the **etiologic factors** giving rise to **infantile atrophy**. Most investigators have found but slight changes in the intestinal canal; Baginsky alone maintains that atrophic changes in the intestinal wall lead to athrepsia and are the essential factor in hindering proper absorption and assimilation. Other investigators, among them Heubner, believe that these changes in the glands and mucosa are **secondary** and caused by inanition. It is certain that some cases of marasmus have well-marked intestinal lesions, the remains of inflammatory processes, which hinder assimilation, while others have few or no lesions and may end in recovery on a suitable diet. Bloch studied 3 cases postmortem. Case 1 showed colitis and fatty degeneration of the liver, cases 2 and 3 interstitial gastritis, case 3 degeneration of some of Lieberkühn's glands. In all 3 cases abnormally few Paneth's cells were filled with mucus in the crypts of Lieberkühn, showing that these cells had lost their functional activity in digestion. Bloch considers that so-called intestinal atrophy is simply dilation and wasting. Some cases of this disease show such slight anatomic changes that we must look to functional disturbances of the digestive organs to explain their causation.

P. A. Potter,³ in discussing the relation of **proteids** to edema in **marantic children**, draws the following conclusions: (1) Cases of acute diarrhea which are not protracted are not accompanied by renal involvement; (2) alcohol is therefore not injurious in this condition if its use is indicated; (3) edema during a diarrhea in marantic infants is a bad sign; it is not necessarily of fatal import, and is not due to the heart or kidneys; (4) the bad general condition is best treated by disregarding the diarrhea and increasing the strength of the proteids. [While some of the statements appear too dictatorial, the value of the final advice appears to be undoubted. The increase of the proteids will always be experimental, however.]

Phillip F. Barbour⁴ believes some good may be accomplished in cases of marasmus by **arsenite of copper**, by reason of its stimulating action on the cells of the mucous membrane of the intestine; since the chief difficulty in true marasmus seems to consist in an interference with absorption.

Byrom Bramwell⁵ records a remarkable case of **infantilism** due to defective **pancreatic secretion** which was improved by the administration of pancreatic extract. The patient at 18 years had the appearance and development of a boy of 11; there was chronic diarrhea and the abdomen was swollen and tympanitic. The deficiency of pancreatic secretion was effectually proved, especially by Sahli's test. With glycerin extract of pancreas the patient has grown 5½ inches in 2 years; the diarrhea has ceased. Bramwell considers that this condition must be a distinct clinical entity.

¹ Virchow's Arch., Bd. clxxiii, p. 1.

² Jahrb. f. Kinderheilk., Jan., 1904, lix.

³ Med. News, Jan. 9, 1904.

⁴ Pediatrics, July, 1903.

⁵ Scottish M. and S. Jour., April, 1904.

Siebert¹ believes that **heredity** is one of the most important etiologic factors in **rickets**. The disease is transmitted chiefly by the mother. Hereditary rickets is, as a rule, milder and occurs later in children at the breast—seldom before the third month. But the severest types of the disease occur in breast-fed children with a strong hereditary tendency, whereas maternal nourishment is relatively the best safeguard against rickets when the hereditary predisposition is lacking. Advanced age in the mother and keeping the child too long at the breast are not in themselves direct causes of rickets. Rickets is not an infectious disease. **Social misery** and diseases of the **digestive** and **respiratory** tracts are, next to heredity, the most important causative agents. Teething and the static functions of the child are dependent on constitutional hereditary influences.

P. W. Nathan² concludes that some **anomaly of metabolism** which, besides causing other abnormalities, is inimical to the normal calcification of bones, must form the starting-point of our search for the cause of rickets. His record shows 477 cases of this disease carefully treated and observed for a period always exceeding one month: 150 (prior to 1901) were treated with phosphorus; 50 (over 6 months of age) were given cod-liver oil; 150 were given soluble monobasic calcium phosphate with sodium chlorid, and 127 received no medication. All the children, so far as possible, were fed on a uniform diet of three-quarters milk and one-quarter water, with lactose added (in the majority of cases). The mixture was brought to the boiling-point and then rapidly cooled. The percentage of improvement varied only slightly, being somewhat higher without medication and lowest with the administration of phosphorus. These observations substantiate the belief that the organism is not dependent upon soluble calcium. Physiologic consideration shows that it receives this salt almost entirely in the form of an organic compound with albumin.

Enlargement of the **phalanges** of the hands and feet in **rachitis** is rarely noted in literature, but Jacob Sobel³ believes that the condition is very frequently overlooked. He reports two examples: The enlargement is probably due to subperiosteal cell-proliferation with imperfect and delayed ossification. Sobel suggests the term **rachitic dactylitis** for the condition. R. Neurath⁴ had previously described this periosteal thickening.

A. A. Rasumoffsky,⁵ from a microscopic study of the bodies of 21 infants, concludes that there are 2 kinds of **craniotabes** in children, the rachitic and the nonrachitic, the latter being due to atrophy or undeveloped structure of the bone, while the former is produced by lack of lime-salts in conjunction with pressure of the brain on the tender bone. The rachitic changes are usually seen after the third month, while atrophic changes may begin even during intrauterine life. During life, rachitic softening can be recognized only in the presence of the character-

¹ Jahrb. f. Kinderheilk., lviii.

² Med. News, Feb. 13, 1904.

³ Roussky Vrach, vol. iii, No. 5.

⁴ Med. News, Feb. 27, 1904.

⁵ Wien. klin. Woch., June 4, 1903.

istic rosary on the thorax. The microscopic pictures of the two conditions are widely different.

E. Spietschka,¹ who has examined a large number of infants in Epstein's clinic in Prague, finds that newly born babes often exhibit softening of the occiput (craniotabes), so-called defects of ossification, yielding and gaping sutures, and misproportion between the size of the head and that of the chest. These changes will later develop into full-fledged rachitis if not treated in time, and their frequent occurrence demonstrates that **rickets** may be and often is **congenital**. Phosphorus and cod-liver oil (of the former, 0.005, to 100 cc. of the latter) may be given from earliest childhood and will prevent the further development of the rachitic manifestations.

Michael Cohn² describes a case of **coxa vara**, the result of early **rickets**. Measurements of skeletons show that slight downward bending of the neck of the femur and slight elevation of the trochanter major are not rarely encountered after severe rickets in infancy. High grades of this deformity are rare. In Cohn's case the skiagram showed downward bending of the neck of the right femur to an almost horizontal position; on the left side the epiphyseal nucleus of the trochanter was abnormally high, the neck of the femur was at right angles to the shaft, the epiphyseal line was broader than normal, and there was a subluxation of the head of the femur so that it rested on the lower part of the acetabulum. That such anomalies may be of rachitic origin is certainly an advance in our knowledge, for hitherto they have always been classed as congenital luxations of the hip, coxitis, fracture of the neck of the femur, etc.

G. E. Shuttleworth³ finds among the poorer classes frequent examples of **mental hebetude** and **backwardness**, not dating from birth, but due to **malnutrition** detrimentally affecting the brain and nervous centers. A rachitic form of feeble-mindedness has been described, and it seems possible that the bossed and thickened skull may interfere with the growth and development of the brain. The malnutrition of rickets which affects the brain-structure itself is probably a more potent factor in such cases of mental backwardness. Even among the children of well-to-do people rickets may result in abnormal mental development. In neurotic children the occurrence of obsessions is sometimes marked. In Shuttleworth's experience a weak mind is apt to become the victim of one overpowering idea if permitted to dwell too much on a single subject; an all-round training of the faculties and interests becomes, therefore, of importance. **Hysteria** in neurotic children is more frequent than supposed; Briquet thinks that children probably furnish 25 % to 33 % of all cases. Shuttleworth recounts the histories of 2 cases of aphasia, probably hysteric in origin, in girls of 3 and 11 years of age. Even in cases of mental backwardness not obviously cretinoid benefit seems to follow the cautious administration of thyroid extract.

Bourneville and Lemaire⁴ found unmistakable rachitic changes in

¹ Jahrb. f. Kinderheilk., lix, Heft 3.

² Jahrb. f. Kinderheilk., 1903, lviii.

³ Brit. Med. Jour., Oct. 3, 1903.

⁴ Arch. de Neurolog., Sept., 1903.

34 out of 435 feeble-minded children. In the rachitic children the mental defects were not congenital, but first became manifest from the eighteenth to the twenty-fourth month of life. An attack of infectious bronchopneumonia or gastroenteritis frequently seemed to be the starting-point. In a few cases so complicated, deformity of the bones alone resulted instead of mental enfeeblement, pointing to one and the same toxic or infectious agent in both. These rachitic children were usually free from the stigmas of degeneration apart from the special deformities of rachitis, so that the mental defect was probably not produced during fetal life.

Steinitz¹ found the **chemic composition** of the **body** unaltered after death in 3 infants, aged respectively 1 month, 2½, and 3 months, who suffered from **disorders of nutrition**. This constancy of chemic composition would seem to indicate that for the normal development all the important elements of the body must be assimilated in the food in the same relative proportions. Loss in weight results from uniform destruction of the tissues without change in the relative proportion of the different constituents.

Carlo Amistani² treated 7 cases of **rachitis** with **glycerinated bone-marrow**. Half an ounce was given daily to 8 children under the age of 2½ years. All improved in weight and general nutrition; the hemoglobin was also increased and the bone pains diminished.

W. S. Colman³ discusses at some length the subject of **infantile scurvy**. The not infrequent occurrence of the disease has been noted in children who are taking a fair quantity of fresh milk in addition to one of the patent foods, especially where such foods have been partially predigested in their manufacture (Cheadle). It is well known that if the predigestion of milk is carried on for a long time, toxic bitter substances will be formed, and it is quite a feasible notion that other bodies may be developed from the proteids of milk by their various modes of preparation which may favor the occurrence of hemorrhagic lesions. [This would not account for the occasional development of scurvy in breast-fed children.]

Radiography may assist the diagnosis of **scurvy**. Lehndorff⁴ found that the imperfect bone-formation at the epiphyseal border was shown in the röntgen-ray picture by a clear zone several millimeters wide lying below the shadow of the line of calcification. This clear zone was especially marked at the upper extremity of the tibia.

T. M. Rotch⁵ reports 2 cases of **infantile scurvy**, one of which was operated on for **osteomyelitis** before the true condition was recognized. He emphasizes the importance of the röntgen ray in a differential diagnosis between these conditions and osteosarcoma.

W. P. Northrup⁶ has observed **lineæ albicantes** on the knees of a convalescent from typhoid fever. Under the chapter on the "Maladies

¹ Jahrb. f. Kinderheilk., 59, Apr., 1904.

² La Pediatria, Aug., 1903.

⁴ Arch. f. Kinderheilk., vol. xxxviii, Hefte 3 u. 4.

⁵ Med. News, Sept. 12, 1903.

³ Lancet, 1

⁶ Med. N

of Growth" Jules Comby has described the condition as a result of such rapid growth of the bones that the skin is not able to keep pace. There result frayings of the skin, the habitual location of which corresponds to the femorotibial regions. In appearance these lesions exactly correspond to those seen in the skin of the abdominal wall in parturient women.

DISEASES OF THE GENITOURINARY TRACT.

F. M. Fry and C. F. Martin¹ have made systematic examinations of the urine from 100 infants, under 3 months of age, including at least 3 samples from each one taken on different days. Sixty-five of the infants were artificially fed; 35 were breast-fed. The average specific gravity of the urine was 1006; 78 % of the specimens from breast-fed infants were acid and 22 % were neutral; from the bottle-fed babies, 91 % were acid and 9 % neutral. Albumin was present in the urine of 15 bottle-fed and 4 breast-fed infants; of these, 17 showed casts. Fourteen cases showed casts without albumin; of these 31 cases, 22 were bottle-fed and 9 breast-fed. Uric acid was present in abundance in the urine of 26 cases; of these, 14 had albumin and casts, 9 had casts, and 1 had albumin alone. Nineteen of the 26 cases died and autopsies were obtained in 7. In each of these uric-acid infarcts were found in the kidney and parenchymatous nephritis; 3 also had acute interstitial changes. Apart from the fatal cases, 6 others had clinical evidence of nephritis. From these cases it may be concluded that nephritis in infants is not alone associated with the toxic conditions incident to marasmus.

W. D. Spanton² refers to a variety of cystitis in young girls produced apparently by fibers of wool from the underwear which had wormed their way into the bladder.

John McCaw³ reports a case of paroxysmal hemoglobinuria in a child aged 5 years 10 months. There was a distinct history of syphilis. The blood-count showed well-marked anemia, with a preponderance of lymphocytes over polymorphonuclear cells.

Bacteriuria is a not infrequent disease in childhood, according to George Mellin.⁴ Infants are especially liable to this infection. Digestive disturbances are often found associated, and doubtless are an etiologic factor. The mode of entrance of the microorganisms into the bladder remains to be determined; in some cases the infection has spread from a perianal abscess. *Bacillus coli communis* is present in most cases. In 2 of Mellin's 10 cases *Staphylococcus pyogenes albus* was found. Constitutional symptoms are rarely observed. Greater frequency of urination and slight fever may be noticed; the urine has a stronger odor than normal and is slightly cloudy. Intestinal antiseptics (salol) and irrigation of the bladder bring about rapid disappearance of the bacteria.

The importance of pyelitis as a cause of prolonged remittent fever has been emphasized by Marcel Hartwig,⁵ who has observed 3 cases in

¹ Arch. of Ped., Jan., 1904.

³ Brit. Med. Jour., July 18, 1903.

⁵ Berl. klin. Woch., Nov. 30, 1903.

² Med. Press, Feb. 24, 1904.

⁴ Jahrb. f. Kinderheilk., lix.

infants. The disease ran a febrile course of 3 to 6 weeks, with considerable involvement of the nervous system. The etiology was cleared up by the finding of cloudy acid urine, full of bacteria and pus-corpuscles. These cases recover with appropriate treatment. Hartwig gave turpentine ij and urotropin gr. j-ij , t. i. d. McKay¹ also reports a case in a child of 7 years in which a diagnosis was first made of typhoid fever. Later, examination of the urine showed a moderately large quantity of pus and numerous **colon bacilli**. Treatment consisted of large doses of citrate of potassium and of urotropin. Recovery was rapid.

Of 75 cases of **enuresis** carefully observed by G. E. Beilby² at the New York State Industrial School, a positive history of **masturbation** was determined in 71. Only 2 of the patients were imbeciles. In a series of 25 of these cases there was found an almost uniform exaggeration of the muscle-reflexes and tendon-reflexes of the lower extremities. It would appear that the irritation and congestion produced by masturbation involved all of the reflex centers in the lumbar cord. Careful examination failed to reveal any local conditions in the genitourinary tract which would account for the symptom, enuresis. As long ago as 1876 Jacobi called attention to the fact that masturbation was a frequent cause of this condition. It is in institutions that the habit of self-abuse numbers the most victims.

G. Kapsammer³ has treated 45 cases of enuresis with **epidural injections** of normal salt-solution. The point for the introduction of the needle is slightly above a line connecting the coccygeal horns of the sacrum. There is usually a slight depression at this point. The needle must be introduced at an angle of 60 degrees as far as the anterior wall of the sacral canal, and then lowered to permit of its further introduction along the line of the canal. Ten to 40 cc. must be injected, with great care to avoid causing disagreeable pressure-symptoms. Good results were obtained in all but 2 cases.

While not wishing to contend that enuresis is a condition of late rickets, Percy Lewis⁴ believes that it involves a weak bodily condition caused by an excessive **starchy diet**, associated with the inability properly to digest that excess.

Hauser⁵ believes that **cyclic albuminuria** is essentially due to disturbances of circulation, perhaps in part to the irritation of poisonous products of metabolism following severe muscular exertions, acting on kidneys which have been anatomically altered by infectious disease and so weakened that they allow the passage of albumin. The pathologic lesion must be looked for in the external epithelium covering the vessels of the glomeruli. Diuresis must be encouraged by alkaline mineral waters, rest must be enforced, and the diet must be bland, principally milk and vegetables, for such time as is required to free the urine from albumin, and at least 8 days longer. Exercise and diet are then very gradually allowed, controlled by test-ach

¹ Indian Med. Gaz., Dec., 1903.

² Amer.

³ Arch. f. Kinderheilk., 1904, vol. xxxviii.

⁴ Brit. Jour. Child. Dis., Feb., 1904.

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extension of exercise, until the kidneys are, as it were, trained and accustomed to the muscular efforts of the body. If this treatment carefully and conscientiously carried out, it will result in eventual cure in the majority of cases, provided there is not an irremediable lesion of the kidneys present. This is unfortunately the cause of cyclic albuminuria in a given proportion of our cases.

Edel¹ finds that the normal increase in blood-pressure after moderate exercise is followed by abnormally low pressure in those subjects inclined to cyclic albuminuria. The subjective sensation of fatigue accompanied the recurring albuminuria. Edel has produced albuminuria at will in these patients by making them indulge in forced respiratory movements by straining as at stool for 10 to 15 minutes. He concludes, therefore, that the condition should be treated by measures to tone up and strengthen the heart muscle and its nerves and not by rest. He even advises appropriate "gymnastic therapy" in chronic nephritis. He emphasizes the point that albuminuria does not occur during the active exercise, but afterward, in the period of lowered pressure.

G. A. Sutherland² has noted the occurrence of **movable kidney** in 15 out of 40 cases of orthostatic or **cyclic albuminuria**, in children under the age of 15 years, and thinks that the association may be more than accidental. On the assumption that this form of albuminuria is dependent on general vasomotor instability and venous stasis of the kidney, it may be possible that the surcharging of the kidney and consequent increase in weight may in time produce displacement. The question as to how far, if at all, the mobility of the kidney affects the occurrence of the albuminuria in these cases might be settled if a patient were surgically treated by fixation of the kidney. [Sutherland's experience emphasizes the fact that mobility of the kidney in children exists to an unsuspected degree.]

Chronic interstitial nephritis of children is described at length by J. E. H. Sawyer,³ and comparisons are made with the disease as it appears in adult life. He concludes that it is more frequent in females than in males, that the pathologic changes are the result of a primary inflammation of the interstitial tissue; that the specific fevers are rarely the cause; that the disease may be congenital in origin, or originate from congenital and inherited peculiarities of the constitution; that it may be due to an "ascending nephritis," starting in the pelvis of the kidney. Sawyer is inclined to believe (with Guthrie) that syphilis, either hereditary or acquired, may be the chief factor in the causation of chronic interstitial nephritis in children, and may also account for many cases of this disease in adults. The 4 pathognomonic symptoms, Sawyer considers, are: (1) **Increased arterial tension**, with hypertrophy of the heart; (2) **polyuria**, the urine containing a small amount of albumin (after several tests); (3) **excessive thirst**; (4) **continued loss in weight**. The onset of the disease is so gradual and obscure as usually to escape notice. In the later stages it ought to be easily distinguished in spite of the rarity of its occurrence.

¹ Deut. med. Woch., xxix, No. 37.

² Am. Jour. Med. Sci., Aug., 1903.

³ Birmingham Med. Rev., Aug., 1903.

Tuberculous meningitis and convulsions must be differentiated from uremia; in the early stages the so-called uric-acid diathesis may resemble this form of nephritis. Besides the difference in the urine, in nephritis we find evidences of arteriosclerosis in addition to the increased tension common to both. The prognosis is, of course, unfavorable. In cases developing soon after birth few live beyond the fifth year; later in childhood, when the symptoms are pronounced when they are first noted, the average expectancy of life is about 1 year. Treatment includes a careful, easily digested diet, with restriction, but not avoidance, of proteids; an equable temperature, so far as possible; warm clothes; occasional saline laxatives, and plenty of water. Digitalis and squills may be used when the pulse-tension falls and the quantity of urine diminishes. For uremia, active purgation, hot-air baths, and saline infusions may be used. Venesection seems to be contraindicated.

George Carpenter¹ believes that **congenital syphilis** may produce a **nephritis** which is clinically indistinguishable from acute catarrhal nephritis, and that interstitial changes in the kidneys may or may not be present in such cases. He reports a case under his care which supports this view both from the clinical and postmortem findings.

A. Arraga² remarks on the **rarity of interstitial nephritis** in childhood, and reports a case with autopsy in an Italian child 9 years old. The parents both suffered from **malaria** at the time of conception, and Arraga believes that the child was infected, by way of the placenta in all probability. Polyuria was noted after the second month of life, and was most marked at night. Generalized neuralgic pains were noted during the second year and remained troublesome features of the child's complaint. Marked thirst, severe headaches, transient edema of the lids and ankles, were noticed, and the child's vision was troubled at times. The child was poorly developed.

E. Mensi³ reports 12 cases of renal affections in **nurslings**, in only one of which uremia occurred. He believes that the cause of these diseases, in some instances, lies in the immaturity of the organism and the lack of full development in the kidneys.

Filia⁴ adds to the literature of **nephritis** after **impetiginous eczema** in infants 6 cases in which a streptococcus was found in the urine. In 29 cases a streptococcus was found in the blood, and in 4 cases a diplococcus.

A remarkable case of **necrosis of a kidney** following an attack of **pneumonia** is reported by Charles Pollard.⁵ Friedländer's pneumobacillus was obtained in cultures from the abscess surrounding the kidney. Removal of the necrosed organ was followed by recovery.

Renal lithiasis is not an uncommon disease of childhood, says Mousseaux,⁶ of Vittel. It is encountered more frequently in older children, and among those whose parents suffer from gout, obesity, di

¹ Brit. Med. Jour., Sept. 12, 1903. ² Arch. de méd. des Enf., May

³ Arch. di Patolog. e Clin. inf., vol. ii, Nos. 3, 4.

⁴ Policlinico Sez. Pratica, 1903, No. 16.

⁵ Birmingham Med. Rev., April, 1904.

⁶ Rev. mens. des Mal. de l'Enf., May, 1904.

uric acid diathesis, and gravel. The essential factors in its production are too great ingestion of nitrogenous food, perverted metabolism, and insufficient elimination with high concentration of the urine. Uric acid is by far the most frequent cause (56 out of 77 cases); oxalates are often associated with uric acid, and phosphates are sometimes the chief factor (9 cases). The appearance of gravel, red, yellowish, or grayish, is the most characteristic symptom. Lumbar pains are frequent and nephritic colic not rare, although the clinical picture is not so well defined as in the adult. Anorexia, lassitude, nausea, and slight lumbar pain may be the only signs besides the passage of gravel. Hematuria was observed 8 times, associated with colic and the presence of oxalates, the blood coming from the kidneys. Disturbances of micturition are very common and may lead to incontinence. Complications are rare. Mousseaux has not met with hydronephrosis. Feebly alkaline mineral waters render most service in treatment, besides the regulation of diet, exercise, sleep, etc. Mousseaux advises caution in the use of uric acid solvents like lycetol and piperazin. The disease is obstinate and treatment must be prolonged to be successful.

Henry Koplik¹ discusses **vulvovaginitis** as seen in hospital service, and describes at length the precautions which he adopts for its prevention. Although these may seem elaborate, he is convinced of the need for them, since he has seen several deaths from gonorrheal peritonitis resulting from vulvovaginitis.

W. P. Northrup² reports 2 cases of **acute gonococcal peritonitis** and abstracts the reports of 8 others. His 8 cases occurred in girls aged 9 and 11 years. In one case, which simulated appendicitis, operation revealed intense peritoneal congestion and slight serous exudate, but there was no marked lesion of the tubes; the appendix was normal. The onset of gonococcal peritonitis is sudden, with pain and vomiting. The abdomen is extremely sensitive, but muscular rigidity is not usually present. Gradual pressure on the abdomen may produce less pain than would be expected. Constipation is often pronounced, but diarrhea may be present. The temperature rises rapidly, usually to the vicinity of 104° F., drops in 2 or 3 days, and may then reach normal or continue from 100½° to 102° F. for about 2 weeks. The pulse is rapid—from 140 to 180; the respirations are thoracic—30 to 50 a minute. In all these 10 cases the abruptness of the onset was noticeable, which was accompanied by "ghastly pallor and algidity, profound prostration and relaxation." All the cases recovered; the prognosis is favorable, so that Northrup advises that when the gonococcus is identified in the vaginal secretion in a case of sudden peritonitis, operation should be deferred. The treatment consists in applying ice to the abdomen; regulation of the diet; enemas and saline laxatives; morphin or codein for excessive pain, with local treatment for the vaginal condition.

P. Galvagno³ presents 3 cases of **subacute or chronic gonorrheal**

¹ Arch. of Ped., Oct., 1903.

² Arch. of Ped., Dec., 1903.

³ Arch. di Patolog. e Clin. inf., vol. ii, Nos. 3, 4.

peritonitis in little girls, following gonorrheal vulvovaginitis. The mortality of cases thus far reported is about 20 %.

Rumiantzeff¹ reports a case of **gonorrheal arthritis** in a girl 6 years old. The treatment, followed by recovery, consisted in immobilization of the affected joint (knee), mercuric-chlorid vaginal douches, and the internal administration of salol.

R. B. Kimball² reports 8 cases of **gonorrheal pyemia** in infants and concludes that: (1) The prevalence of gonorrhea among children, particularly in institutions, is not fully appreciated by the medical profession. (2) The ordinary clinical forms of gonorrheal infection are ophthalmia, vulvovaginitis, and pyemia. (3) The possibility that gonorrheal stomatitis may prove to be the portal for general infections needs further study. (4) The greatest care should be taken to exclude such cases from infants' hospitals and wards.

DISEASES OF THE NERVOUS SYSTEM.

T. D. Crothers³ believes that the use of **opium** in infancy may account for many of the **neurotic diatheses** of adults. Among other things he understands this term neurotic diathesis to mean a tendency to seek relief from every discomfort and pain.

J. H. McCassy⁴ is convinced that the **dangers of overstudy** are more than offset by the evils which follow in the train of ignorance and lack of the restraining influences of school-life. The normal state of the normal child from 4 to 7 years of age is in school. If education is gradually begun, at first by Kindergarten methods, and due allowance is made for children physically and mentally defective, school-life becomes the most important factor not only for the child's mental but also for his physical improvement. More colds and sickness are contracted during holidays than during the continuous school term. Proper hygiene in the school-room is presupposed, and attention must be paid to the health and physical requirements of the individual child. [Our own belief is that overstudy is a very pregnant factor in diseases of adolescence.]

Three examples of **reflex disturbances** associated with **adherent prepuce** are reported by R. M. Simon.⁵ A boy of 18 months suddenly was found to be unable to walk, owing to pain in the hip. The presence of coxalgia was excluded, but no other cause for the condition could be found; another boy of 14 years suffered from obstinate constipation and attacks of severe intestinal colic; a third boy of 3 years would awake at night screaming and complaining of pain in the abdomen. All the cases were at once and permanently relieved by circumcision and relief of adhesions.

John Zahorsky⁶ emphasizes the fact that the causes of high fever, malnutrition, and disease of the brain, resulting in heightened nervous irritability, are to be determined in a case of **eclampsia in childhood**,

¹ Dietskaia Med., 1903, No. 3.

² Med. News, June 18, 1904.

³ Brit. Med. Jour., Mar. 12, 1904.

⁴ Med. Rec., Nov. 14, 1903.

⁵ Pediatrics, Aug., 1903.

⁶ Pediatrics, Aug., 1903.

before we search for a "peripheral irritant." The active treatment of the convulsion itself is the same in each case. In 20 cases associated with high fever he found that gastroenteric infection was operative in only 3 instances; in the remaining 17 the diagnoses included thermic fever, malaria, meningitis, influenza, scarlatina, and tonsillitis. In 13 cases associated with little or no fever 8 were due to rachitis, 2 to epilepsy, 1 to cerebral syphilis, 1 to brain-tumor, and 1 to hydrocephalus.

G. W. Boot¹ records a case of temporary **blindness** and **deafness** following eclampsia in a child of 6 years. The attack followed a week of sight-seeing in Chicago after a quiet life in a country town.

Bruns² considers astasia-abasia and general convulsions not infrequent manifestations of **hysteria** in children. Stigmas are often absent, especially anesthetic areas. The prognosis is good, for children are more open to suggestion than adults. Much depends on the speedy and thorough eradication of the first manifestations of the disease.

In the Pediatric Section of the Society of German Naturalists, Thiemich³ called attention to the "**monosymptomatic**" form of **hysteria** which is not infrequent in childhood. Charcot's stigmas are not present, or much less conspicuous than in adults. In young children (2 to 4 years) we encounter the psychic repetition or continuance of a previous organic disease, whose main symptom is perpetuated by auto-imitation; or the diseases of others are imitated. If the parents or caretakers of the child are of neurotic temperament, the tendency of the child to develop hysteria is abetted by its surroundings; hence the importance of removal of the patient from home.

Head's zones of **hyperalgesia** are frequently found in children, says L. Bartenstein.⁴ Familiarity with their localization and significance may aid the practitioner in his diagnosis. Bartenstein does not believe that this hyperalgesia is the expression of hysteria or neurasthenia, but considers it reflex in origin. He admits that many of his 42 cases were of neuropathic disposition or lived with neurotic parents.

Tetany, says Escherich,⁵ is more frequent in the cold months of the year. Increased irritability of the nervous system is an essential feature of the disease; contractures of the hands and feet frequently do not occur. Laryngeal spasm is associated with some forms of tetany; in more severe cases we may have muscular cramps, or even eclampsia, involving the muscles of the whole body. These conditions may be combined with tetany or alternate with it. In discussing this paper Kassowitz, Hochsinger, and Zappert objected to the grouping of such different varieties of muscular spasm under the denomination "tetany," since their etiologic relation to this disease was not by any means established.

According to Alfred Japha,⁶ **spasm of the glottis** in children is often associated with a definite type of convulsions and local muscular spasms,

¹ Amer. Med., Aug. 1, 1903.

² Jahrb. f. Kinderheilk., 1903, lviii.

³ Jahrb. f. Kinderheilk., 1903, lviii.

⁴ Jahrb. f. Kinderheilk., 1903, lviii.

⁵ Wien. med. Doktorenkollegium, Nov. 23, 1903.

⁶ Berl. klin. Woch., Dec. 7, 1903.

and constitutes a disease characterized by heightened reflex irritability of the nervous system, which we may call **tetany**, analogous to the disease in adults. Cold weather and bad hygiene favor the outbreak of this spasm of the glottis, but most important in etiology are **disturbances of nutrition** heightening an already existing functional disturbance. Cow's milk may be the exciting factor. By excluding milk from the diet attacks are cut short.

Beck¹ narrates a case of **tetany** in a child 6 years of age, probably of gastrointestinal origin, associated with **chronic interstitial nephritis**. Autopsy revealed degenerative changes in the ganglion-cells of the motor region of the cortex, fatty degeneration around the cerebral vessels, and fatty changes of the marrow-fibers in the posterior root-zones of the cord.

An instance of **hemicrania** with paralysis of the third nerve is reported by James Taylor.² Charcot has designated these cases "migraine ophthalmoplegique," to distinguish them from ordinary attacks of migraine with visual symptoms—"migraine ophthalmique." In all cases which have been examined at autopsy some morbid condition involving the trunk of the third nerve has been discovered—tumor, exudation, or granulation. Recovery from the paralysis will therefore probably prove to be only temporary.

Hippolyt Chizunoff³ describes 2 cases of **acute ascending polyneuritis** with postmortem findings. In the first case, a healthy 8 months old infant, there followed, after a diarrhea lasting 2 weeks, a painful paraplegia, with loss of reflexes and partial loss of sensation. Death resulted from appendicitis 5 years later. Chronic intestinal catarrh preceded the development of paraplegia in the second case, a girl of 2 years. Soon after, paresis of the right arm, rigidity of the neck, transient ptosis, facial paralysis, and paralysis of the left arm followed. Death occurred suddenly without fever or loss of consciousness. Postmortem investigation revealed in both cases signs of degeneration of the ganglion-cells in the anterior horns, especially in the lumbar region. In the first case the sciatic nerve showed parenchymatous degeneration, marked atrophy, and interstitial changes, while the sacral nerve in the second case showed only slight parenchymatous change. Chizunoff considers the changes in the cord as secondary ascending degeneration following primary peripheral neuritis. [Since the brain was not examined in the second case the possibility of an encephalitis cannot be excluded.]

Pitreo⁴ found that the general **infantile mortality** in the offspring of **tabetic patients** (father or mother being affected) was 40.7 %. He is inclined to attribute the low vitality of the child to the syphilitic taint in the parent, which is a condition precedent, if not the cause, in most cases of **tabes**. The children of tabetic parentage who lived beyond childhood were, with few exceptions, mentally and physically sound.

Progressive spinal muscular atrophy is a rare disease in infancy.

¹ Jahrb. f. Kinderheilk., lix, Heft 3. ² Brit. Jour. Child. Dis., Jan., 1904.

³ Inaug. Essay, Zurich, 1903

⁴ Jour. de Med. de Bordeaux, July, 1903.

G. von Ritter¹ reports 2 sporadic cases, in children under 2 years of age, of the type described by Hoffmann, which is characterized by its rapid course and its frequent occurrence in members of the same family. These cases seldom survive more than 2 years. The paralysis and atrophy attack first the muscles of the pelvis and lower extremities, in contrast to the early involvement of the upper extremities in the adult. The first symptoms are usually noted in the latter half of the first year; increase of subcutaneous fat masks at first the muscular wasting, and may be a marked feature, as in the cases here reported. Pathologically we find atrophy and disappearance of the ganglion-cells of the anterior horns throughout the cord, most marked in the cervical and lumbar enlargements, with slight degeneration of the peripheral nerves and high-grade muscular atrophy.

Ernst Praetorius² studied the pathologic anatomy of 3 fatal cases of **acute anterior poliomyelitis**. In all 3 the remains of a vascular myelitis were found, involving the anterior columns and the area supplied by the central artery. There was extensive destruction of the gray matter. The vascular degeneration in the most recent case involved the vessels of the anterior fissure and of the pia mater. Clarke's columns were also affected. There were also evidences of destruction and atrophy in many of the ganglion-cells of the affected area. More extensive anatomic changes were present than the clinical symptoms would warrant, as is so often the case.

Mistakes in the **diagnosis of infantile palsy** are prone to occur before the walking period of life, unless careful examination is made in cases of sudden transient high temperature. F. Savary Pearce³ found that these attacks are often ascribed to "gastrointestinal disorders," and the subsequent paresis and wasting may not be noted until the child begins to walk. Apropos of this subject, it is interesting to note that many cases of infantile palsy in childhood involve only one lower extremity; thus dislocation of the hip-joint may ensue, adding to the deformity. In these cases, of course, operative reduction of the dislocation cannot prove of permanent benefit.

During the past few years there have been numerous opportunities for the study of **epidemic cerebrospinal meningitis** in New York city. Koplik⁴ gives a careful résumé of 37 instances of this disease, and of 35 of the tubercular form. In 21 of the 37 cases the *Meningococcus intracellularis* was obtained by lumbar puncture, which corresponded in type to that found by Mallory and Wright and by Osler and Hirsch. The organism was not found in the nasal secretions, but was present in the conjunctivas, in one case. Of the epidemic cases, 60 % were under 2 years of age; all types of the disease were seen, including several malignant cases fatal within 36 hours. Rigidity of the neck was a constant symptom; skin and tendon reflexes were present early in the disease, but were apt to disappear in rapidly fatal cases. The Babinski reflex was present in 4 of 17 cases studied; in contradistinction, it was found in 20 out of 26

¹ Jahrb. f. Kinderheilk., 1904, lix.

² Jahrb. f. Kinderheilk., lix.

³ International Med. Mag., July, 1903.

⁴ Pediatrics, June, 1904.

cases of the tubercular form. Koplik believes this sign is of little value in infants under 2 years; the same holds true of Kernig's sign. In cases over 2 years Kernig's sign was uniformly present, whereas it was absent in 8 cases out of 26 of the tubercular form. There was extreme hyperesthesia of the surface and mental irritability in all the epidemic cases; in marked contrast was their absence in tubercular meningitis. In 2 out of 13 of the acute cases the Macewen sign was obtained, whereas it was present in 11 out of 17 tubercular cases and in chronic cases of the epidemic form. Facial paralysis and optic neuritis were found only in the most severe cases of epidemic meningitis, but were present in a majority of the tubercular forms. The temperatures in the epidemic cases exhibited the widest irregularities; cutaneous rashes were rarely observed; a polynuclear leukocytosis, ranging from 20,000 to 55,000, was present in all the cases. The tubercular cases showed distinctly lower counts, only one case exceeding 24,000. Of the 21 substantiated epidemic cases, the mortality was 42.8 %. Most of the fatalities occurred under 1 year of age. In the cases that recovered, however, there were no sequelae. Otitis media was the most common complication. Koplik finds that while lumbar puncture is not curative, it affords relief from symptoms of pressure, and if rigors are frequent, the withdrawal of purulent exudate is indicated. A thick, purulent exudate is of grave prognostic import. Guiseppe Mya¹ records an instance of cerebrospinal meningitis due to infection with Pfeiffer's bacillus. Bronchopneumonia had followed the attack of influenza. The important subject of injections of antiseptic fluid following the removal of exudate by spinal puncture is added to by Morris Manges,² who reports 3 successful cases treated by injection of a 1 % solution of lysol into the spinal canal, a method first proposed by Carlos Franca at Lisbon in 1903.

From the study of an epidemic of 60 cases of **cerebrospinal meningitis**, in 27 of which the diplococcus of Weichselbaum was present, Sørensen³ found that the onset was usually sudden and stormy, often with clouding of the intellect, delirium, chills, vomiting, pain in the head, localized or general convulsions. In some cases the onset was more gradual. The fever usually rose rapidly in the early days of the disease, often to remit, with a secondary rise. Sudden remissions of fever were common. The whole course of the disease may be short, sometimes followed by an acute exacerbation. Or we encounter a prolonged febrile stadium in the severer cases, with intermissions in the fever. The irregularity of the fever-curve was most marked toward the end of the disease in the first days. The fever usually ended by lysis. Gradual rise of the temperature in the fatal cases was observed in but one instance, but sudden rise of fever within a few days of the fatal termination was a frequently observed phenomenon. During the course of the disease pain, vomiting, and desire for sleep are prominent symptoms; apathy and sleepiness often follow exacerbation of pain and fever; in severe cases relaxation, cyanosis, loss of weight, and cold extremities show the depression of the organism.

¹ Riv. di Clin. Pediat., July, 1903.

² Pediatrics, June, 1904.

³ Jahrb. f. Kinderheilk., lxx.

Acute serous leptomeningitis is characterized by the early appearance of optic neuritis. Carl Beck¹ found choked disc an almost constant symptom in a series of 5 cases. At necropsy the ventricles were found much dilated by the increased amount of interventricular fluid, the ependyma was evenly swollen and thickened and of slightly granular consistence, cloudy swelling and proliferation and round-cell infiltration were noticeable beneath the ependyma, in the brain and cord and meninges especially along the vessels. Such cases are well called *ependymitis* or *ventricular meningitis*.

F. Huber² reports a case of **serous meningitis** from disease of the middle ear, in which the excess of meningeal fluid, seen at the time of operation, when the bulging dura mater was exposed, was relieved by lumbar puncture without opening the meningeal cavity. Recovery was uninterrupted after a second tapping.

Chauffard and Boidin³ relate 2 cases of meningitis complicating parotitis. The diagnosis was established in both cases by lumbar puncture.

Roger Voisin⁴ has studied the modifications in the cerebrospinal fluid and in the cortical cells in **pneumonia and bronchopneumonia complicated by meningeal symptoms**; analogous modifications are found in pneumonia not complicated by meningitis, so that the results must be considered as the reaction of the cerebrospinal fluid in the course of pneumonia. The liquid is usually clear, very rarely turbid, the quantity of albumin often increased, and the amount of chlorids decreased, with few or no leukocytes in the centrifugate. Ordinarily the fluid is sterile. Even when it is purulent and contains microbes, cultures could not be obtained. Streptococci often resemble diplococci in cerebrospinal fluid and are hard to distinguish from pneumococci. Histologically we may encounter all grades of inflammation of the meninges. In the cases with meningeal symptoms alterations in the pyramidal cells of the cortex were uniformly present. Voisin considers that this condition is due to toxins in the circulatory blood; it is essentially an infectious encephalitis.

G. Tugendreich⁵ describes an extensive **meningoencephalitis** of the cortex in an infant with **hereditary syphilis**, characterized by fever, marked dyspnea, cyanosis, tachycardia, stupor, very marked nystagmus and twitching of the eyelids, and followed by hydrocephalus. Lumbar puncture gave a clear fluid without increase in albumin or typical morphologic changes. The reflexes were not increased, and there were no convulsions. Antisyphilitic treatment was of no avail. The child died of bronchopneumonia during the fifth month of its life. Positive symptoms of meningeal disease were noted in the sixth week, and were preceded by a specific coryza. At autopsy there were found endarteritis of the vessels of the cortex, nuclear proliferation in the adventitia, small-celled

¹ Jahrb., f. Kinderheilk., 1903, lviii.

² Medicine, Jan., 1904.

³ Soc. med. des Hôp., Mar. 25, 1904.

⁴ Rev. mens. des Mal. de l'Enf., May, 1904.

⁵ Jahrb. f. Kinderheilk., 1903, lviii.

perivascular infiltration, a moderate exudate of fluid rich in cells, and some recent hemorrhages.

C. Cabannes¹ describes a case of **ophthalmoplegia** in a child of 10 months, probably due to **hereditary syphilis**. There was bilateral ptosis, external rotation of the globes, and complete loss of motion, with pupils dilated and unresponsive to light, but no lesions in the fundus. Purulent coryza had existed since birth, the skin was muddy-colored, and the bridge of the nose depressed. The ocular symptoms were noticed at the age of 8 months.

The case of a boy 10 years old dying from endothelioma of the brain posterior to the right optic thalamus, with chronic hydrocephalus, is reported by W. C. Chaffey.² Owing to persistent refusal of all solid food and extreme emaciation, without definite cerebral symptoms, a diagnosis of hysteria was first made. Later the boy developed attacks of intense headache, tonic contractures of the extremities, especially on the left side, with involuntary passages of urine and feces and well-marked optic neuritis. A case of double tubercular granuloma involving the left lenticular nucleus and the right optic thalamus in a girl of 7 years is reported by Marshall and Jacob.³ The complicated symptoms the authors designated as those of pseudobulbar paralysis. There was complete absence of other tubercular lesions. A true case of bulbar paralysis due to glioma of the pons in a boy of 6½ years is reported by Sutherland⁴ and Holland. The absence of optic neuritis, vomiting, and extreme headache were suggestive of an infiltrating growth rather than an isolated mass causing vascular disturbance—a surmise which was verified at autopsy.

Henry Ashby⁵ reports a case of hydatid cyst of the brain involving the right frontal lobe and the anterior horn of the lateral ventricle in a boy aged 8½ years. Symptoms had appeared 3 years before death, and consisted of headache, vomiting, and attacks of syncope. Later there were twitching of the right side of the face, spasticity of the left arm and leg, probably from pressure on the right internal capsule, optic neuritis, and paresis of the third nerve. It was assumed that the tumor was too deep-seated for operation, although autopsy proved otherwise. Ashby suggests that signs of increased intracranial pressure and intense optic neuritis should always indicate the propriety of trephining.

Simon⁶ performed lumbar puncture twice in a case of **cerebellar tumor**. The cerebrospinal fluid contained a very small amount of albumin, a good many lymphocytes and erythrocytes. Iodin was not demonstrable, although the child had taken 60 grains of the salts of iodid daily for several days. The association of paralysis of the right fifth, sixth, seventh, eighth, and ninth cranial nerves with intense headache, Kernig's sign, and convulsions, made the diagnosis of cerebellar tumor possible. Autopsy showed a large tubercular mass filling the cerebellar

¹ Jour. de Méd. de Bordeaux, July 26, 1903.

² Brit. Jour. Child. Dis., May, 1904. ³ Ibid.

⁴ Ibid.

⁵ Brit. Jour. Child. Dis., Feb., 1904.

⁶ Rev. mens. des Mal. de l'Enf., July, 1903.

space and compressing the right hemisphere. The cervical glands were enlarged (tubercular?).

DISEASES OF THE SKIN.

A. Passini¹ describes an epidemic of pemphigus neonatorum occurring at the Foundling Hospital in Panna. He is inclined to group the malady with the infectious fevers like variola and varicella rather than with the pemphigus dermatitides. Adults are rarely affected, and always by contagion from children. The disease is usually seen toward the end of the first week of life, and thereafter diminishes in frequency in inverse proportion to the age. It is quite distinct from so-called syphilitic pemphigus, and is caused by an unencapsulated diplococcus, as described by Demme, Claessen, and Beck.

Raoul Labbé and Demarque² found the **Klebs-Löffler bacillus** twice present in the lesions of **impetigo** and **ecthyma**; in both cases the same microorganism was present in the throat without clinical manifestations of diphtheria. The lesions of the skin were slow in healing, but differed in nowise from the usual appearance of staphylococcus infection of the skin.

W. F. Litchfield³ has observed 2 cases of **diphtheric erythema intertrigo** in infants, confirmed by bacteriologic culture.

E. F. Cushing⁴ calls attention to a **stomatitis in impetigo contagiosa**, which is due to a like infection—an association which seems to have been overlooked by most American authors.

Hugh H. Borland⁵ reports a case of **acute eczema pustulosum** in an infant, complicated by fatal **duodenal ulcer**. Eczema capitis of moderate degree commenced during the second month; during the eighth month the lesion suddenly became markedly worse, affecting the head, face, neck, and upper part of the trunk. The duodenal complication seemed to be analogous to that found in burns.

E. Feer⁶ considers that the connection between certain cases of sudden death and eczema of the scalp in infants is undoubted, although not understood. He is inclined to regard infantile eczema as a manifestation of a dyscrasia, the study of which would probably elucidate the problem of the status lymphaticus.

Joseph⁷ recommends solutions of **bromocoll**, 5 % to 20 % in strength, to relieve the itching of lichen urticatus, subacute and chronic eczemas. The solution (bromocoll solut. 5—10—20, zinc oxidi, amyli aa 20, glycerin 30, aquæ dest. ad 100) must be painted on with a brush.

Paul Fabre⁸ believes that **herpes zoster** is not very rare in childhood. He has seen 63 cases in children under 15 years of age, 25 of which began

¹ Gior. ital delle Malat. vener. e delle pelle, 1903, vol. xlv.

² Rev. mens des Mal. de l'Enf., 1904, xxii.

³ Australasian Med. Gaz., Aug. 20, 1903.

⁴ Arch. of Ped., June, 1904.

⁵ Lancet, Oct. 17, 1903.

⁶ Correspondenzblatt f. Schweiz. Aerzte, Basle, xxxiv, No. 182.

⁷ Wien. klin. Rundschau, 1903, No. 28.

⁸ Rev. mens. des Mal. de l'Enf., Dec., 1903, xxi.

with pain. The suffering may be intense enough to cause insomnia or even convulsions; it usually lessens when the eruption appears. The course of the disease is from 8 to 15 days. Fever is more commonly present than in adult life. Fabre recommends painting the lesions with equal parts of 2 % cocain and 1 : 1000 adrenalin solution.

The occurrence of **herpes zoster** in cases of prolonged administration of **arsenic** has been described, but J. H. Sequeira¹ reports a case of **psoriasis** associated with herpes zoster and generalized bullous eruptions. The withdrawal of the drug was followed by rapid drying-up of the lesions and persistent pigmentation.

W. S. Gottheil² obtains better results in the treatment of **tinea tonsurans** with sublamin (ethylendiamin sulfate of mercury) than with any of the usual agents.

I. Comby³ emphasizes the frequency with which **lichen scrofulosorum** or cutaneous tuberculosis occurs in childhood and adolescence, from the age of 2 to 15 years. Measles often precedes the outbreak and precipitates the manifestations of a latent tuberculosis. Tubercle bacilli are rarely found in the lesions. The eruption consists of small, round, deeply pigmented isolated papules, but slightly elevated above the skin and distributed over the whole integument. The papules are flat or conic, topped by a scale or thin horny scab; sometimes by a minute vesicle or pustule, which quickly dries. Constitutional treatment is more important than local. The eruption often persists for months, or disappears to break out again. It heals without scars.

R. B. Ness⁴ reports a case of **leukoderma** of 5 years' duration in a boy of 11 years. It had first been noticed after an attack of what was probably scarlatina. The family history did not show any marked nervous stigmas, and it seems probable that the scarlatina determined the skin affection, which is generally considered to be a trophoneurosis.

THERAPEUTICS AND TOXICOLOGY.

Ernö Deutsch⁵ has given purgen tablets (baby-purgen, each tablet containing $\frac{5}{16}$ of a grain of phenolphthalein) with success to over 500 children, varying in age from 1 month to 10 years. Purgin acts well in habitual constipation in the great majority of cases, and is easily taken on account of its pleasant taste. In larger doses purgen may be used to evacuate the gastrointestinal canal in acute digestive disturbances. Toxic symptoms were never noted; the drug has no bad effect on the heart or kidneys. Purgin is excreted mainly with the feces, a small portion with the urine, and a minimal portion is absorbed. The Mosso sphygmometer showed lowering of blood-pressure after phenolphthalein.

From the narration of Gutmann's⁶ 8 cases, 7 of them cardiac, 1 of them renal, **theocin** seems as well suited for the treatment of children as

¹ Brit. Jour. Child. Dis., Apr., 1904.

² Arch. de méd. des Enf., Apr., 1904.

³ Centralb. f. Kinderheilk., Feb., 1904.

⁴ Arch. f. Kinderheilk., xxxviii, Hefte 3 u. 4.

⁵ Med. News, Oct. 17, 1903.

⁶ Arch. of Ped., Dec., 1903.

of adults. It is especially valuable as a diuretic in cardiac dropsy, does not irritate the kidneys, but sometimes causes gastric disturbance.

In his Harveian lectures D. B. Lees¹ insists upon the great applicability of the ice-bag in the acute visceral inflammations, such as pericarditis, pneumonia, and pleurisy. He has also successfully employed it in acute nephritis, taking the precaution to insure warmth in the body and extremities before applying it. In the latter condition he believes it possesses a well-marked diuretic effect. Relief to the right heart by leeches or by bleeding he considers to be a neglected but invaluable aid in the treatment of pneumonia.

A. L. Oberdorfer² reports a case of **bromoform poisoning** in a child of 4½ years. The symptoms were alarming and unconsciousness lasted 15 hours, but recovery took place on the fourth day. Free bromin and hydrobromic acid were demonstrated in the bottle containing the bromoform.

J. W. Price and E. M. L'Engle³ record a fatal case of poisoning from **oil of gaultheria** in an infant 2 years old, the amount being estimated at one dram.

¹ Brit. Med. Jour., Nov. 28, 1903.

² Arch. of Ped., Nov., 1903.

³ Am. Jour. Med. Sci., Feb., 1904.

PATHOLOGY AND BACTERIOLOGY.

By DAVID RIESMAN, M.D., AND A. O. J. KELLY, M.D.,
OF PHILADELPHIA.

TUBERCULOSIS.

The Modifications of the Human Tubercle Bacillus.—According to the experiments of J. Auclair,¹ it is possible, by certain methods of culture, especially by agitation, to transform the bacillus of Koch into a saprophyte. This new bacillus grows with great rapidity as a homogeneous culture on the usual mediums, such as bouillon, agar, potato, and gelatin. It develops well in the incubator at a temperature of 37° C., but also at the temperature of the laboratory, although less rapidly. It is mobile, strictly aerobic, ferments lactose, liquefies gelatin, and is stained by the usual reagents, but does not stain by Ehrlich's method. When inoculated into animals, it is found to have lost its virulence and infectiousness, although still retaining a certain degree of toxicity. The toxins of this organism, obtained by the processes usually employed to produce the poisons of the Koch bacillus, are totally different in their action from those of the virulent tubercle bacillus. With ether and chloroform extracts it is impossible to provoke either a true pneumonic process, caseation, or sclerosis. The bacillus is undoubtedly derived from the Koch bacillus. This is proved by the ability to obtain it at different times by adopting the same methods, also by the frailty of the organism at the end of its transformation, and, above all, by the tinctorial properties exhibited at certain phases of the transformation by organisms which partake of the nature both of Koch bacilli and of the homogeneous bacilli.

Observations on the Morphology of Bacillus Tuberculosis from Human and Bovine Sources.—To make a study of the variations occurring in pure cultures of human and bovine tubercle bacilli at different ages and on different mediums and at the same time to make a comparison of the two types of bacilli when grown under these different conditions, S. B. Wolbach and H. C. Ernst² (Boston) obtained 11 pure cultures—4 from human origin and 7 from bovine. The results furnished by these observations incidentally confirmed the evidence of the relationship of the tubercle bacillus, both the human and the bovine types, with the higher bacteria. The culture-mediums employed were glycerin-agar, sterilized beef-serum, with and without glycerin, Löffler's blood-serum, glycerin veal bouillon, Dorset's egg-medium, and human brain.

¹ Arch. de Méd., 1903, t. xv, No. 4, p. 469.

² Jour. of Exper. Research, 1904, x, 313.

They find that the tubercle bacillus undergoes marked morphologic changes with every change of culture-medium; the microscopic characteristics of a fully developed culture are fairly constant for each medium; if grown for several generations on a given medium, no tendency for fixed characteristics to impart themselves are noted; the change in form is just as prompt and complete as when the transplantation is performed after a single generation. The changes cannot be explained by assuming that the sole difference is in the favorability of the medium for the growth of the tubercle bacillus; both Dorset's egg-medium and the brain-medium must be classed as extremely favorable ones, growth on each appearing at about the same time and progressing about equally rapidly. The reaction of the medium also does not explain these changes, as the different mediums may have precisely the same reaction and yet these changes occur. They found the greatest variation in form and staining reaction in rapidly growing cultures, and agree with Coppen-Jones that favorable mediums and free access to oxygen tend to branched and filiform forms. The only interpretation of the great diversity of forms assumed under the most favorable conditions is that the bacillus is truly pleomorphic, and should be classed among the higher bacteria.

Variations in the Agglutination of the Bacilli of Tuberculosis.—S. Arloing and P. Courmont¹ have investigated the agglutinative relations of the various types of tuberculosis—human, bovine, and avian. Among 3 homogeneous cultures of human tuberculosis they found one type that was easily agglutinated by most of the tuberculous serums of human and bovine origin; another type was absolutely nonagglutinable by all serums; and a third type was of variable agglutinability. A bovine culture was found to be as agglutinable as the first type of human tuberculosis, while 2 cultures from birds were totally deprived of agglutinability. Hence the conclusion that the power of agglutinability varies for different cultures and does not depend on their origin. This reaction cannot be used to distinguish between human and bovine tuberculosis. The agglutinating power of the various tubercular serums also showed variability. Some of the serums, both human and bovine, agglutinated all the cultures that showed themselves susceptible to this reaction. A certain number of the human serums were not able to agglutinate even the most susceptible cultures. This lack of agglutinating power seems to bear some relation to the virulence of the infecting tuberculosis and the extent of the lesions. Some unknown condition in relation to the nature of the soil is also a determining factor in this connection.

The Passage of Tubercle Bacilli Through the Normal Intestinal Wall.—To prove that tubercle bacilli are able to pass through normal intestinal walls M. P. Ravenel² (Philadelphia) experimented on healthy dogs. After a dose of castor oil and a subsequent 24-hours' fasting they received through a stomach-tube an emulsion of equal parts of melted butter and water containing large numbers of tubercle bacilli. The dogs

¹ Rev. de la Tuberculose, June, 1904, 2d series, vol. i, No. 3, p. 133.

² Jour. of Med. Research, 1904, x, 460.

were killed 3½ hours later and the chyle and mesenteric glands collected; with this material guineapigs were inoculated intraperitoneally. The entire intestine was carefully examined after washing it out, and microscopic sections made in 2 cases from several portions of the gut. In no instance could any lesion be detected. Of 10 dogs, 8 gave positive results; 24 guineapigs were inoculated from the 8, and of these, 21 showed well-marked tuberculosis and 2 remained well. The macroscopic diagnosis was in every instance confirmed by microscopic examination of sections. In only 3 cases could tubercle bacilli be demonstrated in the material from the dogs used for inoculation. The 2 negative dogs were the first 2 experimented on, and a weakened human tubercle bacillus was employed on them; in all the others virulent bovine bacilli were used. From these experiments we can conclude that tubercle bacilli can pass through the normal intestinal wall with great facility and rapidity. The most favorable condition for this is during the digestion of fatty foods. Chyle is carried directly into the blood-stream through the thoracic duct, thus explaining why infection may first show itself in the lungs, or at least why the lesion in the lung may be as old as the lesion in the intestines. The claim that a food-tuberculosis should show itself in a primary intestinal lesion is fallacious and misleading.

Experimental Tuberculosis.—J. de Haan¹ succeeded in producing typical tuberculosis in various Javanese animals by inoculation with bacilli cultivated from human sputum. Perfectly healthy sheep and cattle, however, withstand the infection. He concludes that there is no racial immunity to tuberculosis in the animals experimented upon (goat, cattle, horse). The absence of tuberculosis among the herds of Java must, therefore, be attributed to other causes. Perhaps the life in fresh air has something to do with it. The ape is very readily inoculated with bacilli taken from man. He finds that the lungs are the favorite seats of the tubercular process, and that the administration of food containing bacilli may cause tuberculosis of the lungs and bronchial lymph-glands, with or without involvement of the intestines and mesenteric glands.

Destruction of Tubercle Bacilli in Heated Milk.—W. Rullmann² (Munich) found that to kill all the tubercle bacilli in milk it is necessary to bring the milk to a temperature of 168° F. and to keep it at that for one hour, the milk during this time being in constant motion. If quickly cooled off afterward, its taste is not spoiled, its albumin and lecithin are not destroyed, and if heated carefully so as not to exceed the temperature mentioned, its enzyme contents do not suffer. Various other temperatures and various other periods of time failed to kill the pathogenic germs.

Mammary Tuberculosis: A Process for the Recognition of Tubercle Bacilli.—L. Nattan-Larrier³ describes a method for the determination of tubercle bacilli in suspicious fluids. The liquid is injected into the mammary gland of a guineapig during the period of lactation. The injection is made in the axis of the gland, within the areola. The expressed milk should be systematically examined, beginning 2 or 3 days

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 1, S. 1.

² Münch. med. Woch., 1904, li, 508. ³ Arch. de Méd., 1904, t. xvi, No. 2, p. 177.

after the injection, employing the usual carbolfuchsin method. The bacilli appear in the milk in from 5 to 15 days after inoculation, and a rough estimation of their virulence can be made from the rapidity of their appearance in the milk. This method has been found valuable for serous, seropurulent, and purulent fluids, but is not directly applicable for serofibrinous liquids. For the latter an injection is made into the mammary gland during the seventh week of pregnancy, followed 5 or 6 days after by a subcutaneous injection of tuberculin. When the fetus is expelled 5 or 6 days later, the tuberculosis develops very rapidly in the gland, and may be demonstrated either in the milk or by histologic examination.

Studies on Tuberculin Reaction.—Interesting experiments of practical importance were made by E. L. Trudeau, E. R. Baldwin, and H. M. Kinghorn¹ (New York) on the nature and specificity of the tuberculin reaction. The subjects for inquiry which suggested themselves were: 1. Can the diagnostic use of tuberculin scatter the disease and produce new tuberculous foci? Answer: In localized corneal tuberculosis of the rabbit's eye no spread of the disease in the cornea could be observed after the use of tuberculin injections. On the contrary, as in previous observations, a favorable absorptive influence was noted upon the diseased focus. 2. What relation has healed or eradicated tuberculosis to the reaction? Answer: Extirpation of a tuberculous focus was followed by loss of reaction susceptibility in the one rabbit, where the operation was thorough. 3. Is the reaction always dependent upon the presence of specific tubercles? Answer: The experiment shows that specific tubercles are necessary to a local tuberculin reaction. When bacteria inclosed in capsules were introduced into the peritoneal cavity of animals, no signs of local reaction were found about the capsules containing tubercle bacilli, except when imperfectly sealed. The temperature elevations gave no certain evidence of susceptibility to tuberculin resulting from the presence of bacilli in the filter-capsules. Hence it is evident that either the poison contained in the bacilli was not diffused through the capsules in sufficient amount to produce susceptibility in the surrounding tissue, or, if so diffused, did not remain stored in the tissues, as has been assumed to be true of tubercles containing actual living or dead bacilli. In either case the presence of tubercle bacilli or their substance in the tissues appears necessary to a true tuberculin reaction. Moreover, the nuclein substance of tubercle bacilli will not pass through a filter, and it is known, by chemie research, to be the most important poison in tubercle bacilli. 4. What relations have the alleged reactions from other substances to the true tuberculin reaction? Answer: Temperature and local reactions may occasionally result from the injection of trypsin, peptone, and sodium cinnamate. The reactions were not uniform and rarely took place, except when large doses were injected; such doses, by their bulk, may produce constitutional disturbance and fever. Atropin produced no reaction in moderate doses. The local reactions occurred very seldom, and except in

¹ Jour. of Med. Research, 1904, xii, 169.

fatal poisoning by peptone did not bear a close resemblance to the typical tuberculin reaction; nor is it possible to say that they were the result of a direct action of the substance injected upon the tuberculous tissue. The production of so-called "partial antibodies" under such conditions may be taken to explain the reacting power of peptone and certain bacterial products other than those derived from tubercle bacilli, but which contain chemically similar groups, notably nucleoproteids. The direct action of trypsin upon tuberculous abscesses failed to produce reactions, and this does not favor an enzyme theory of the tuberculin reaction. 5. How long after infection with tuberculosis does reaction susceptibility begin? Answer: The temperature variations in individual guineapigs and rabbits preclude uniform results from tuberculin reactions in the early stages of tuberculosis. When the average temperatures are considered in series of 5 guineapigs, the reaction susceptibility is apparently distinct on the fourth and fifth days after inoculation, then irregular until the fourteenth day, after which reactions are the rule. Since it is well known that 10 to 15 days are required for the full development of tubercles, it is more than probable that the specific susceptibility is not fully acquired until this stage is reached. 6. What constituent of the tubercle bacillus induces reaction susceptibility in the animal? Answer: The tuberculin-extracted bacilli used in this experiment probably still retained enough active substance to produce susceptibility. The fat-extracted bacilli appeared to have more reacting substance than the others, judging from the higher temperatures obtained in them. Neither were completely extracted, so as to be free from intact, well-stained tubercle bacilli. The nuclein substance of the bacilli was presumably more abundant in the fat-extracted bacilli, and may produce reaction susceptibility independently of the fat, though this is only suggested by the results of the experiment.

Studies on Tuberculous Serums and the Bacteriolysis of Bacillus Tuberculosis.—E. R. Baldwin¹ (New York) has found, after many experiments, that: 1. Specific differences can be recognized between the serum of calves that have overcome an intravenous inoculation of human tubercle bacilli and that of normal calves. 2. These differences can be detected 4 months after inoculation, but disappear gradually. 3. The absorption hemolytic test may reveal the presence of specific agglutinins for the tubercle bacillus. 4. Nonspecific agglutinins may cause sedimentation of tubercle bacillus emulsions without a corresponding reaction by the absorption hemolytic test. 5. It is possible that other antibodies of an amboceptor nature are present in those serums which indicate a marked affinity for tubercle bacilli by the absorption hemolytic test. 6. It is possible that such reactions are related to immunity, although in the experiments performed by him the evidence for this view is only of negative value, since the absence of resistance for tubercle bacillus infection coincided with absence of any absorption hemolytic differences. 7. Agglutination is not an evidence of immunity, though it may indicate resistance to tubercle bacillus infection. 8. A long duration of the pro-

¹ Jour. of Med. Research, 1904, xii, 215.

tection conferred on calves by human bacilli against an after-inoculation by bovine bacilli is called in question by these experiments. 9. The method of inoculation with the human bacilli, their virulence, the reaction and recovery without remaining traces make it strongly probable that some of the calves, at least, had for a time a high resistance against bovine tuberculosis.

Experiments with Tuberculins made from Human and Bovine Tubercle Bacilli.—S. B. Wolbach and H. C. Ernst¹ (Boston) performed experiments—(1) to determine the relative virulence of cultures of human and bovine tubercle bacilli; (2) to determine the relative strength of the tuberculins made from these cultures; and (3) to note their effects in the treatment of tuberculous guineapigs. The tuberculin made from the bovine bacillus reacted just as powerfully upon guineapigs infected with the human bacillus as upon those infected with the bovine bacillus, and the same was true of the tuberculin made from the human bacillus. There was no difference in specificity between tuberculin made from human and that made from bovine tubercle bacilli. The tuberculin treatment, on the whole, acted favorably upon tuberculous guineapigs. There are, the authors believe, no essential differences in the disease-processes caused by the human and bovine tubercle bacilli.

Comparisons of the Tuberculins of the Human and Bovine Tubercle Bacilli in the Diagnosis of Bovine Tuberculosis.—M. Kanda² (Tokio) finds bovine tuberculin much more reliable and suitable, as the reaction with it is more marked and rapid. R-tuberculin injected intravenously produces the maximum reaction in from 6 to 8 hours. Kanda states that bovine tuberculosis was unknown in Japan 30 years ago, and has developed only since foreign cattle have been imported, and by direct infection and crossing of the types have spread the disease. This circumstance, as well as the fact that the Japanese, who do not partake largely of cow's milk, nevertheless suffer extensively with pulmonary tuberculosis, leads Shiga, in a postscript, to say that he agrees with Koch in believing the 2 varieties of tubercle bacilli to be absolutely different. [These results differ from those of Wolbach and Ernst; evidently the question is not easily answered, but *a priori* one would expect the tuberculins from human and from bovine sources to be different.]

The Origin of Pulmonary Tuberculosis.—Behring³ (Berlin) says that tuberculosis is produced only by tubercle bacilli, but while they may vary slightly as to form and shape, there is but one variety, even though Koch maintains the type varieties of the bovine and human bacillus. Naegeli, by examining the cadaver in the postmortem room at Zurich, found practically every one above 30 to be tuberculous; between 18 and 30 about 96 % of the patients had traces of the disease, 50 % of those between 14 and 18, 33 % of those between 5 and 14, and 17 % between 1 and 5 had tuberculous foci. Infants less than 12 months old were usually found uninfected. In many cases the tuberculin test is the only

¹ Jour. of Med. Research, 1904, xii, 295.

² Zeit. f. Hyg. u. Infectiönsk., 1904, xlvii, 202.

³ Deut. med. Woch., 1903, xxix, No. 39.

sure means of making the diagnosis. The tuberculin reaction is due to coagulation and agglutination, when tuberculin comes in contact with the otherwise soluble antibody produced in the tissues by the action of the tubercle bacilli. This test, in doses of from 1 to 5 mgr., was employed by Franz, of Budapest, on soldiers in their first year of service, with the result of finding 61 % tuberculous; in their second year 68 % reacted positively; when 10 mgr. were used, 96 % reacted. Of 96 infants in which Behrend employed the same dose, all gave a negative result. Jousset's inoscopy helps to discover tubercle bacilli in many doubtful cases. These figures prove the uselessness of quarantining against tuberculosis in densely populated places, and show the difference between tuberculous infection and "consumption" and the spontaneous curability of the disease in many people. Behring does not believe in the importance of infection by traumatism, direct contact, inhalation, or heredity; the latter does not exist as more than a predisposition, although a few authentic cases of placental infection exist. By far the greatest number of cases arise postgenitally, and, according to Behring, the milk fed to infants is the chief source of tuberculosis, thus emphasizing the infection of milk before ingestion. Infants drinking infected milk contract the disease readily because their digestive tract is devoid of a continuous epithelial lining, the gaps allowing the passage of albumin and bacteria like any porous filter. Numerous experiments establishing these facts are quoted. The first signs of the infection are usually seen about the glands of the neck, the lungs becoming affected secondarily. The comparative mortality statistics of bottle-fed and breast-fed infants is another proof of the danger of milk. Tuberculous infection may remain latent for years or even for life, not developing into pulmonary tuberculosis until some specially disposing condition is met with. Behring prevents tuberculosis by treating cattle with tuberculosis vaccine. He has achieved brilliant results in the immunization of cattle throughout Germany. Thus far the immunization has been carried out with injections, but he hopes to do the same by feeding the virus to calves by mouth, and if this is possible, the method ought to be applicable to infants also. The antitoxin method is, however, much more promising. The milk of highly immunized cows must certainly contain protective substances, which can be conveyed successfully to man, and the only thing necessary is to discover something by means of which these immune bodies can be conserved. The immunity produced by these antibodies, which would naturally be of short duration, could be prolonged by combining the living virus with the antibodies. He ends his article by denying Koch's contention concerning the difference between human and bovine tubercle bacilli. Koch bases his argument on 3 points: Human bacilli will produce "Perlsucht" in cattle. This fact proves, according to Behring, that they are identical. Human bacilli will immunize cattle against the disease, just as vaccine immunizes against smallpox; no one says that vaccine bacilli and smallpox bacilli differ. The absence of danger of bovine tuberculosis (Koch's second argument) is a statistical and not experimental deduction, and has been disproved

repeatedly. The logical deduction of his first 2 arguments (the superfluity of sanitary laws and regulations against food-products from infected bovines) is considered wrong by Behring, so far, at least, as infants are concerned, when the anatomic structure of their gastrointestinal tract is taken into consideration. The universal belief of clinicians in the inhalational origin of pulmonary tuberculosis makes it difficult to accept Behring's view of the intestinal origin of tuberculosis.

Primary Intestinal Tuberculosis in Children.—N. Raw¹ found 3 cases of primary intestinal tuberculosis among 600 cases of the disease on which he performed necropsies. They were in children varying in age from 1½ to 3½ years. He considers these cases, as well as the frequent instances of primary tuberculosis of the mesenteric glands without implication of the intestine, to be due to infection with the milk of tuberculous cows. Even though the bacilli of the human and bovine race are different in type,—a fact which he considers clearly proved,—the latter possess for the human organism, and especially for that of the child, a virulence not to be underestimated.

Sources of Infection in Tuberculosis.—A. Davies² performed necropsies on 50 tuberculous children and 173 tuberculous adults. In the children the source of infection was to be found chiefly in the home surroundings; in 31 instances out of 37 some one living in the house was found to be tuberculous. Milk could be traced as the cause in only 2 cases. Intestinal tuberculosis is of much rarer occurrence since the introduction of strict milk supervision. In adults the disease was acquired not only at home, but also at stores, factories, and saloons. The last are especially dangerous, first, because it is there that tuberculous patients congregate after being unable to work, and, second, because drinkers have less resisting power than other persons.

Contribution to the Etiology of Tuberculosis.—J. Mitulescu³ (Bucharest) made a study of the dirty corners of 97 books (chiefly novels and fairy tales) and magazines; they were shaken and soaked in physiologic salt-solution for 24 hours, squeezed out, and the turbid fluid centrifugated. The fluid was injected into 177 guineapigs. Of 120 animals injected with fluid from books less than 2 years in use not one died of tuberculosis, while of 57 animals injected with fluid from books more than 2 years in use ½ developed tuberculosis and others died with septicemia, malignant edema, etc. He believes that the tubercle bacilli are deposited there by the sneezing, coughing, etc. of readers suffering from the disease, or probably from their finger-nails. Animals injected with fluid containing cut ends of finger-nails of tuberculous patients all died of tuberculosis. [These observations have great practical importance and should lead librarians to destroy old books, or at least to disinfect them. Some of the books lent out by public libraries are, like much of our paper money, absolutely filthy.]

Spread of Tuberculosis in the Male Genitourinary System.—From a study of 11 cases C. Hueter⁴ concludes that tuberculosis of the

¹ Brit. Med. Jour., May 28, 1904, i.

² Lancet, Nov. 28, 1903, ii.

³ Zeit. f. Hyg. u. Infectiousk., 1904, xlv, 397.

⁴ Ziegler's Beit., 1904, Bd. xxxv, Heft 2, S. 252.

genitourinary tract in the male is always of hematogenous origin, and starts in one, or simultaneously in several, of these organs: prostate gland, epididymis, kidneys, or seminal vesicles. From these centers the disease spreads in a descending manner—*i. e.*, with the current of the secretions. Exceptions to this rule may occur, as in tuberculosis of the vas deferens arising from disease of the seminal vesicle or infection of the bladder from the prostate. This latter organ is very frequently the first to be affected of all the organs, but plays a small part in the spread of the disease, with the possible exception of extension to the urethra. In the narrow canals (vas deferens, ejaculatory duct) obliteration may occur, and may limit the spread of tubercular infection in that direction. Likewise previous obliteration of these ducts from gonorrhea or other cause will also afford a barrier to the extension of the tuberculosis. Disease of the urethra may arise from the urine, prostatic fluid, or spermatic secretion. Ectogenous infection, according to these investigations, plays no part in the origin of genitourinary tuberculosis.

GENERAL BACTERIOLOGY.

Typhoid Fever Complicated by a Diplococcic Infection.—From their observations in 4 cases H. Leroux and M. Lorrain¹ conclude that certain grave symptoms occurring during the course of or convalescence from typhoid fever are due to a secondary infection. This infection has also been observed by others, and usually presents itself in an epidemic form. The characteristic symptoms are vomiting and a multiform erythema. The pathogenic agent, in the cases observed by the writers, seemed to be a diplococcus analogous to *Diplococcus hæmophilus*, described by Deguy in paradiphtheric infections, and approaching in some characteristics the enterococcus of Thiercelin.

Postmortem Bacteriologic Examinations of the Blood.—The investigations of M. Simmonds² resulted in the finding of bacteria in the blood of almost half of the cases examined postmortem. Very seldom was more than one kind of organism found, the most frequent by far being the streptococcus; then followed the pneumococcus, colon bacillus, and staphylococci. The streptococcus was found most frequently in scarlet fever, also in diphtheria, phthisis, and various acute inflammatory and purulent processes. The colon bacillus was found principally in cases in which there had been disease in the neighborhood of the digestive tract. The pneumococcus was found most frequently in cases of pneumonia, but also occurred occasionally in the blood of persons dying from other acute inflammations (meningitis, pleuritis, malignant endocarditis, etc.). Out of 129 cases of scarlet fever the streptococcus was found 88 times. Bacteria were found with especial frequency in the blood of patients dying from ulcerative pulmonary tuberculosis, the organisms being the streptococcus, pneumococcus, and colon bacillus. In typhoid fever the Eberth bacillus was found only 6 times out of 16,

¹ Arch. de Méd., 1903, t. xv, No. 5, p. 613.

² Virchow's Arch., 1904, Bd. clxxv, Heft 3, S. 418.

while other organisms were found in a few cases. In the wound-infection diseases (erysipelas, phlegmon, etc.) the bacteriologic investigation of the blood was almost always positive, as it was likewise in pyemia, septicemia, and puerperal sepsis. The streptococcus was the organism most frequently found. In cases of malignant neoplasm the blood was sterile in 45 out of 63 cases. In most of the positive cases the colon bacillus was the organism found, the neoplasm usually being a disintegrated cancer of the gastrointestinal tract. Organisms were frequently found in diseases of the genitourinary tract, also in lobular pneumonia, and especially in peritonitis following operations.

A Study of Chronic Infection and Subinfection by the Colon Bacillus.—G. A. Charlton¹ (Montreal) injected cultures of a colon bacillus of low virulence into the spinal cord, with the result that an anemia was produced not quite comparable with the classic forms seen in man. In some respects, in the very great oligocythemia, the marked poikilocytosis, and the appearance of nucleated red corpuscles it resembled pernicious anemia. In the hemoglobinemia being parallel with the decrease of red corpuscles, in the absence of a distinct and extensive Quincke's siderosis, and in the absence of clear evidence of inflammatory or other disturbance of the digestive tract, and of well-marked changes in the bone-marrow, it differed from pernicious anemia. In the advanced stages of this anemia a diffuse degeneration of the spinal cord affecting the posterior and lateral columns in the lumbar and dorsal regions was set up. The change consisted in a fatty degeneration of the myelin-sheaths of the fibers and pigmentary changes in the nerve-cells of the gray matter. The ventral columns of the cord and the bloodvessels were unaffected. Killed or filtered cultures of the colon bacillus did not produce the same kind of changes. When living cultures were acted upon by pepsin and injected intravenously, they did not differ materially in their action from the original living culture.

The Occurrence of the Colon Bacillus on the Hands.—Of 111 persons examined by C. E. A. Winslow² (Boston), 10 were found to have *Bacillus coli* on their hands. In one experiment children were selected for examination whose hands appeared especially dirty, but in all the other cases the subjects were taken at random. Excluding this experiment, 4 positive results were obtained from the hands of 48 children; of 35 technologic students, 2 yielded positive results; of 16 servants and janitors, 1. Of the 12 dirty children, 3 were so affected. It appears from this that the colon bacillus was present on the hands of from 5 % to 10 % of the persons examined; it also shows how easy it therefore is for the typhoid bacillus to be transmitted by the hands of those affected with the disease or of their nonprofessional attendants.

Influenza Bacilli in Tonsils and Larynx.—M. Auerbach³ (Cologne) has made cultural studies of the larynx and tonsils of 700 patients suffering from diphtheria, scarlet fever, and diphtheroid anginas to determine the frequency of the presence in pure culture of the influenza bacillus

¹ Jour. of Med. Research, 1904, xi, 507. ² Jour. of Med. Research, 1904, x, 463.

³ Zeit. f. Hyg. u. Infectiönsk., 1904, xlvii, 259.

or organisms resembling it. He considered only such cases as positive where the bacillus was present in pure culture. The positive results divide themselves as follows: diphtheria, 12 cases; scarlet fever, 3 cases; diphtheria and scarlet fever, 6 cases; diphtheria and measles, 7 cases; diphtheroid anginas, 10 cases. It is of significance that the bacteria were found at other times than during influenza epidemics. The author holds that all the bacteria resembling the influenza bacillus, such as the trachoma bacillus, *Bacillus catarrhalis*, *Bacillus pertussis* of Eppendorf, and others, should simply be termed influenza bacilli, as there is no absolute method of differentiation. He prefers the term *Coccobacillus hæmophilus*, as employed in France, to that of influenza bacillus.

Bacteriology of Empyema in Children.—W. J. S. Bythell¹ (Manchester) has studied a large number of cases of empyema from the standpoint of their bacteriologic etiology; his results are summed up in the following sentences. The infection, in the majority of instances, is derived by a process of direct invasion of microorganisms from a pulmonary lesion; in children it is almost always a bronchopneumonia. The interval between the pneumonia and empyema averages about 4 weeks. In many of the apparently primary cases the source of infection is an undiscovered patch of pneumonic consolidation. The pneumococcus is the cause in most of the cases among children, and is usually present in pure culture. The streptococcus may occur alone, but all the others are present only in mixed infection. The possibility of an associated pulmonary tuberculosis must always be considered; a joint infection of the lung by pneumococci and tubercle bacilli is more likely to be followed by a purely pneumococcic infection of the pleura than by one due to both these microorganisms, when the affection is observed in the acute stage. The pneumococci in the pus retain their vitality outside the body for a longer period than those in the first series of cultivations upon agar or blood-serum which are made from it. Their vitality is also increased by keeping the pus under anaerobic conditions. The bronchial glands are invaded by the organism in every case of empyema. The fresh areas of bronchopneumonia which frequently make their appearance in an apparently normal part of the lung during an empyema may be due in some cases to infection from the pleura; in others, to extension of previously latent foci.

The Dysentery Bacillus Group and the Varieties which Should be Included in it.—W. H. Park, K. R. Collins, and M. E. Goodwin² (New York) have determined that the great majority of bacilli isolated from cases of nonamebic dysentery may be grouped in 3 distinct varieties. In severe epidemics the most common type is that of Shiga. These bacilli do not produce indol or ferment mannite, maltose, or saccharose. Animals injected with this type produce specific agglutinins in abundance, but for this type only and very little that combines with the others. The second type ferments mannite and produces an acid; it does not split maltose or saccharose in peptone solution or agar. It produces

¹ Jour. of Path. and Bact., 1904, ix, 359. ² Jour. of Med. Research, 1904, xi, 553.

indol. Animals inoculated with it develop immune-bodies and agglutinins specific for the type; also others having affinity for bacilli of type 3, and a few for bacilli of type 1. The third type produces indol, ferments mannite, and acts energetically upon pure maltose and feebly upon saccharose. Animals injected with it develop specific immune-bodies and agglutinins for types 2 and 3; also for many bacilli of the colon group. They develop but few for type 1. A number of bacilli have also been isolated, which, although agreeing with one or the other in some respects, do not in others. They suggest the name of paradysentery bacilli for the 2 last-named groups as being most closely related to the first and most important of the organisms isolated.

Chronic Subcutaneous Abscess in Man Containing Acid-proof Bacilli in Pure Culture.—W. Ophüls¹ (San Francisco) reports the case of a man who, some months after a hypodermatic injection, developed an abscess at that point. In smears from the pus and in cultures branching, acid-fast bacilli were found. No other organisms were present.

The Occurrence of *Bacillus Pseudodiphtheriæ* in Cow's Milk.—D. H. Bergey² (Philadelphia), in the course of an investigation of the bacteria occurring in milk drawn directly from the udder, found organisms having the morphologic character of *Bacillus diphtheriæ*. Sometimes they were alone; at others, associated with pyogenic bacteria. The milk always contained some pus, which Bergey believes to have been due to the pus-organisms and in part maintained by the other bacillus. Three distinct groups of these organisms were encountered: those in which both morphologic and biologic characters are closely allied to *Bacillus diphtheriæ*, the organisms presenting distinctly club-shaped forms with definite striations. In the second group the organisms are shorter, less distinctly club-shaped, though presenting the strias; they differ in their biologic properties by the more definite chromogenesis, more definite production of alkali in milk, and the production of indol by several of the specimens. The third group differs distinctly from *Bacillus diphtheriæ*; they present the polar granules of Neisser, very little striation, and at times a tendency to the formation of club shapes. This group has no chromogenesis in agar, the growth being pure white; on blood-serum and potato there is a yellowish tinge. They produce definite alkalinity and some indol. He believes these organisms to have their normal habitat on the skin and mucous surfaces of the cow, just as in man.

The Toxic Properties of *Aspergillus Fumigatus* in Relation to the Season of the Year.—By extraction with alcohol and ether a toxin can be obtained from the fungus *Aspergillus fumigatus* which will produce tetanic convulsions in the animal organism. C. Ceni³ finds that the properties of this poison depend to a certain extent on that complex of climatic phenomena connected with the various seasons of the year. The phenomenon, no doubt, has relation to the alternation of latent and active life, exhibited by this and other vegetable forms. During the

¹ Jour. of Med. Research, 1904, xi, 439.

² Jour. of Med. Research, 1904, xi, 445.

³ Ziegler's Beit., 1904, Bd. xxxv, Heft 5, S. 528.

period of active life—i. e., the spring and summer months—the fungus finds itself in the best condition for elaborating the toxin in question. During the latent period another toxin is produced; this is connected with the intimate structure of the parasite, especially its spores, cannot be extracted with alcohol, and produces merely local inflammatory phenomena in the animal organism.

Destruction of Bacteria by Boiling Under Low Pressure.—J. Schut, Jr.¹ (Utrecht), constructed a special apparatus to determine the length of time necessary to kill bacteria when kept under pressure lower than normal. He employed for the purpose *Bacillus prodigiosus*, *B. fluorescens*, *B. coli*, *B. typhosus*, and *B. anthracis*. He found that ordinary heating does not kill bacteria and spores suspended in a fluid as quickly as when the fluid is permitted to boil at the same temperature. Within certain limits the length of time necessary to destroy organisms by simple heating diminishes as the temperature is raised. When boiled under lowered pressure, bacteria die even within physiologic temperature limits. At all temperatures saturated steam is superior to boiling in destroying properties. The temperature at which they have been cultivated and the medium in which they are suspended have considerable influence on the resistance of the bacteria. The older the culture of spores, the more resistant. To destroy all vegetating forms, especially all pathogenic organisms, heating for $\frac{1}{2}$ hour at 60° C. is sufficient; in the case of milk it is necessary to keep the vessel closed. Saturated steam at 90°, from a practical standpoint, is as efficient as saturated steam at 100°. Schut believes the action of the vapor is due to chemic changes within the bodies of the bacteria which the mechanic action of the boiling produces. The spores and bacteria attain a higher temperature within the vapor than the vapor itself has.

Duration of Life of Anthrax Spores.—A. von Szeke² (Budapest) studied cultures of anthrax and malignant edema spores which were 18½ years old. The gelatin had been kept at ordinary room-temperature and exposed to diffuse light all these years and was perfectly dry. Upon recultivation organisms were developed from both varieties of bacteria, which, when injected into white mice, produced typical lesions and death. In addition to illustrating the resistance of the organisms, the tests show that the two bacteria can live together for years without interfering in the least with each other's growing and infecting power.

The Influence of High Pressure on Microorganisms.—G. W. Chlopin (Odessa) and G. Tammann³ (Göttingen) exposed a variety of microorganisms to high pressure to determine its influence on their biologic properties. They found that neither bacteria and fungi nor yeasts are destroyed by a pressure of 3000 kg. pro 1 cm. This is equal to 2904 atmospheres. A single rapid but even increase of pressure to 3000 kg. and a similar lowering of pressure exert but a slight influence on microorganisms. Similar changes of pressure repeated 6 times exert a mark-

¹ Zeit. f. Hyg. u. Infectiönsk., 1904, xlv, 323.

² Zeit. f. Hyg. u. Infectiönsk., 1904, xlv, 359.

³ Zeit. f. Hyg. u. Infectiönsk., 1904, xlv, 117.

edly paralyzing influence on bacteria. The effects of a constant pressure of from 2000 to 3000 kg. are proportionate to the height of the pressure and the length of time which it acts. The paralyzing effect of the pressure increases with the temperature. The symptoms of the paralysis are: (1) Feebleness in movements; (2) slowing or loss of the property to multiply; (3) slowing or loss of the property to produce typical reactions, such as fermentation with yeast and *Bacillus coli communis*, or formation of pigment with *Bacillus prodigiosus* or *Sarcina rosea*; (4) lessening of virulence. Pressure acts differently in the different organisms: *Bacillus pyocyaneus*, *B. pneumoniae*, *Vibrio cholerae*, and *V. Finkleri* are very sensitive; *Bacillus coli communis*, *B. typhosus*, *B. prodigiosus*, *B. tuberculosis*, *B. pseudotuberculosis*, *Micrococcus agilis*, *Staphylococcus aureus*, and *Sarcina rosea* possess a moderate amount of resistance. Very resistant are the bacilli of pseudodiphtheria, of anthrax, yeasts, and *Oidium lactis*.

Staphylococcus Aureus and Rheumatic Fever.—Poynton and Shaw¹ (London) have shown, by animal experiments on rabbits and monkeys, that *Diplococcus rheumaticus* is the real cause in the production of rheumatic polyarthritis. *Staphylococcus aureus* is not able alone or in mixed infection to produce articular rheumatism. The disease, therefore, is not to be considered a pyemia which has been produced by an attenuated staphylococcus.

Acute Rheumatism and Diplococcus Rheumaticus.—From the knee-joints of 2 patients suffering from acute articular rheumatism associated with cardiac complications J. M. Beattie² (Edinburgh) isolated an organism corresponding in every detail with *Diplococcus rheumaticus* of Paine and Poynton. Experiments with rabbits resulted in the production of acute joint-lesions as well as cardiac vegetative affections, from all of which the same organism could again be isolated. He, therefore, is of the opinion that this diplococcus is the causal agent of acute rheumatism.

Acute Rheumatic Fever and Its Etiology.—W. V. Shaw (Oxford)³ performed a series of experiments with organisms sent him by Wassermann, Walker, and Poynton, and claimed by them to be the casual factors of acute articular rheumatism and its complications. He found that these organisms were capable of producing the arthritis, pericarditis, myocarditis, endocarditis, and pleurisy, as well as the visceral lesions of acute rheumatism in the infected rabbits and monkeys, and concludes that the particular microorganisms, *Micrococcus rheumaticus* of Walker, *Diplococcus rheumaticus* of Poynton, and *Streptococcus aus Chorea* of Wassermann are identical organisms and are the actual infective and causal agent of acute rheumatism. He found the organisms to correspond, so far as morphology and cultural characteristics are concerned. [Of the infectious nature of rheumatism there can be no doubt; the editors also believe that acute articular rheumatism is a specific disease, not an attenuated pyemia; but the evidence that the

¹ Lancet, Jan. 9, 1904, i.

² Jour. of Path. and Bact., 1904, ix, 272.

³ Jour. of Path. and Bact., 1904, ix, 158.

cause is the organism of Poynton, of Wassermann, or of Walker, is not sufficient.]

Pathologic Anatomy of Pertussis and the Occurrence of Pertussis Bacilli in the Organs.—According to the investigations of G. Arnheim,¹ pertussis is an infectious catarrh, affecting the mucous membranes of the respiratory passages, especially the trachea. The characteristic micro-organism is found in colonies in the secretions of the air-passages and in their mucous membrane. Desquamative catarrh occurs frequently. If the lungs are involved, the bacilli may be found in moderate numbers in the bronchopneumonic foci. The characteristic coughing spells are caused by the presence of colonies of bacteria in those situations where foreign particles always cause coughing. The paroxysms are to be regarded as curative measures, as countless bacteria are thus expelled. The secretion in pertussis becomes viscid, probably under the influence of pus-producing organisms, which exert an increased chemotaxis on the leukocytes.

SMALLPOX, SCARLET FEVER, AND MISCELLANEOUS INFECTIONS.

The Pathologic Anatomy and Histology of Variola.—W. T. Councilman, G. B. Magrath, and W. R. Brinkerhoff² (Boston) describe the macroscopic and microscopic findings in 54 autopsies on smallpox cases. The following summary contains the most important part of their results: The specific lesion of variola is a focal degeneration of stratified epithelium, vacuolar in character, and accompanied by serous exudation and the formation of a reticulum. The fully developed product is a characteristic pock or pustule, which occurs only on the skin and mucous membranes. The lesions may be few or numerous; they are most numerous on the face and hands, fewest on the legs; their size varies widely and they may become confluent. The cell of the lower layers of the epidermis degenerates; serous and later cellular exudation occurs, which increases until the reticulum ruptures the lesion, becoming a filled pustule. The papillary border may undergo necrosis, the corium then forming the bottom of the pustule. The subsidence of the lesion and the repair are accomplished by absorption, drying, regeneration, and exfoliation, the whole taking about 2 weeks. Edema, cellular infiltration, and hemorrhage into the corium may occur simultaneously. Mucous membranes, not having a thorny layer, are rarely the seat of a vesicle and never of a pustule, the degenerated epithelial cells being cast off. Contained within these lesions of the skin and the mucous membrane and determining their specificity and occurring chiefly in the cells of the rete mucosum is the parasite peculiar to variola; in its younger or cytoplasmic form it is present in the protoplasm of the epithelial cell of early lesions, and of such of the older lesions as are extending; in its intranuclear forms it is,

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 3, S. 530.

² Jour. of Med. Research, 1904, xi, 12.

for the most part, in lesions more advanced. No parasites have been found in any lesions of the skin in which repair was well advanced. In the bleb-like lesions, in which the entire epidermis is elevated by fluid exudate, and which simulate the specific lesions, the parasite is absent. The hematopoietic organs show changes so constant and well marked as to be well-nigh characteristic, although occurring to some extent also in other infections. In the spleen, lymph-nodes, and bone-marrow mononuclear, basophilic cells are formed, and in the lymph-nodes and marrow, phagocytic endothelial cells. The former pass into the blood in large numbers. Focal and interstitial infiltration with these cells occurs in the testicle, kidneys, liver, and adrenal glands; in the first so frequently and marked as to produce anemic focal necrosis through pressure and thrombosis; this seems specific of variola. Toxic focal necrosis and focal formation of phagocytic cells occur in the blood-forming cells of the bone-marrow; it constitutes an almost pathognomonic lesion, but is devoid of parasites. Toxic diffuse degeneration is present in the liver, the kidney, the adrenal gland, and the testicle; cloudy swelling in the liver is more marked than in any other acute infectious disease. Otherwise the degeneration is not to be distinguished from that due to bacterial infection. Inhibition of cell-differentiation by the action of toxins is evidenced in the bone-marrow by the absence of complete transformation of antecedent cells into polynuclear leukocytes, and in the testicle in the absence of spermatogenesis. The first of these is peculiar to variola. The paucity of polynuclear leukocytes everywhere is so constant and pronounced as to render it a peculiarity of the disease. In addition to these specific lesions and associated conditions of indeterminate specificity others were found due to bacterial infection through channels incidental to the lowering of resistance. The liver, kidney, adrenal gland, and testicular changes mentioned above may in part be due to the toxins of pyogenic bacteria. Inflammatory processes, constituting complications of varied importance, are present with a frequency dependent upon their position. Boils, erysipelas, and cellulitis are common but unimportant sequels. Pharyngitis and consequent bronchopneumonia are frequent in severe cases. Lobar pneumonia, gangrene, and abscess of the lung occur occasionally. Endocarditis, pleuritis, and empyema are relatively uncommon. Acute lymphadenitis is present in all severe cases.

Experimental Variola in the Monkey.—G. B. Magrath and W. R. Brinkerhoff¹ (Boston) inoculated 12 monkeys with variola-virus from human beings with the following result: 1. *Macacus* and *Rhesus* monkeys are susceptible to variola inoculata. 2. The disease in these animals pursues a typical course, with more or less constitutional reaction and fever, and presents lesions of the skin consisting ordinarily of a primary pock at the site of inoculation, sometimes with local secondary lesions and less commonly with an associated general exanthem. 3. The disease is accompanied by a disturbance in leukocyte-equilibrium characterized by a polymorphonuclear, followed by a mononuclear, leukocytosis, the full significance of which cannot be interpreted as yet. 4. The disease

¹ Jour. of Med. Research, 1904, xi, 230.

produced in the monkey by inoculation is not identical with variola vera in man; it agrees with variola inoculata. 5. The lesions contain, within the epithelial cells of the epidermis and of the hair-follicles, *Cytoryctes variolæ*. 6. Successful inoculation with variola confers immunity to subsequent inoculation with variola or with vaccinia. 7. Different strains of virus from different epidemics exhibit different degrees of virulence for the monkey. Virus from severe variola produces severe lesions and is more likely to be followed by a general eruption. The virus can be transferred from man to monkey, from the monkey to the rabbit's cornea, through 4 generations, and when then inoculated on the monkey, can produce a protopustule followed by a general exanthem.

The Life-history of *Cytoryctes variolæ* (Guarnieri).—The life-history of *Cytoryctes variolæ*, the protozoan discovered by Councilman and claimed by him to be the cause of variola, is given very interestingly and in great detail by G. N. Calkins¹ (Buffalo), who considers the subject in three aspects: The portion of the life-history of which we are certain; the portion of which we have evidence, but upon which we need more light, and, lastly, the portion of which we are entirely ignorant. The first includes: (1) A knowledge of the gemmule and its growth, leading (2) to the cytoplasmic adult ameboid; (3) the process of gemmule-formation and autoinfection No. 1; (4) the residual cytoplasmic structures; (5) the development of the pansporoblast; (6) the development of the primary sporoblast and autoinfection No. 2; (7) the spore and its germination; (8) the development of the secondary sporoblast and autoinfection No. 3; (9) the method of spore-formation; (10) structures which appear like fertilized eggs; (11) structures which appear like developing microgametes; (12) the residual structures of nuclear origin; (13) similar organisms parasitic in nuclei of other animals. The second includes—(1) The actual entrance of gemmules into the nucleus; (2) the significance of the intranuclear sporoblast following upon the adult cytoplasmic ameboid form; (3) the origin of the pansporoblast mother-organism. These may possibly all be summed up in—(4) the sexual phenomena. The portions of the life-history of which we are entirely ignorant are—(1) The first stages of the organism in a new host; (2) the transportation of the infecting agents of the blood; (3) the method of cell and nuclear infection; (4) the significance of the inhibition of the nuclear phases in the vaccine organism. [The observations of Calkins lend much interest to the question of the supposed parasitic nature of smallpox, but until conclusive evidence is supplied, we see no reason for modifying the opinion we expressed last year—that the bodies described may be interpreted as degeneration products. Conclusive evidence of their parasitic nature is still wanting.]

Etiology and Pathology of Vaccinia.—E. E. Tyzzer² (Boston) has been able to demonstrate cell-inclusions, which are specific to vaccinia, in a large number of experimental vaccinations made upon rabbits. Lesions containing identical inclusions are produced if human variola-virus is inoculated upon the rabbit's cornea. The various types of vac-

¹ Jour. of Med. Research, 1904, xi, 136.

² Jour. of Med. Research, 1904, xi, 180.

cine bodies are closely related, and form a series which form a definite relation to the development of the pathologic process in which they are found. No evidence has been obtained that these vaccine bodies represent a form of cell-degeneration, and it is impossible to duplicate them in any other process. They are simulated most closely by the youngest stages of certain intracellular parasites. The process following vaccination varies with the site inoculated, and there is slight species variation. Hydropic degeneration is constant throughout all lesions, and constitutes the primary change. In corneal and nasal lesions epithelial proliferation occurs second. From his investigations he believes the vaccine body to be an organism representing the etiologic agent in the disease. This view is based on the following evidence: 1. The bodies consist of a substance, which resembles protoplasm in structure, and which always contains masses having the staining reaction of chromatin. 2. The bodies show variations in form corresponding to a developmental cycle. They began as small bodies of approximately the same size in the early lesions, increase in size up to a certain point, and then undergo segmentation, to form the small bodies from which the series started.

The Occurrence of *Cytoryctes Variolæ* (Guarneiri) in the Skin of the Monkey Inoculated with Variola-virus.—G. B. Magrath and W. R. Brinkerhoff¹ (Boston) inoculated 12 monkeys with variola-virus and studied the lesions. They did this for the purpose of comparing the lesions of experimental variola with the lesions in the human skin. They found that the epithelial cells of these lesions contained certain structures which were identical in form and staining reaction with those in the lesions of smallpox in man. These forms fall readily into serial arrangements, such as described by Calkins in the lesions of man. These developmental lesions correspond with the evolution of the parasite. The complexity of structure, the staining reactions, and the serial nature of these bodies preclude the possibility of their being products of degeneration. The parallelism between the development of the parasites present in the lesions of variola inoculata in the monkey and the evolution of the lesion, together with the parallelism between the morphology and the staining reactions of these bodies and that of the bodies found in the lesions of variola in man, leads us to attribute to them an etiologic role in variola.

A Study of the Etiology of Variola.—W. T. Howard and R. G. Perkins² (Cleveland) have made a series of studies on the etiology and pathology of smallpox. Concerning the former they announce that they can confirm *in toto* the primary protoplasmic stage of *Cytoryctes variolæ*, having been able to follow every step and to find every form of it, as described by Councilman, Calkins, and their coworkers. They have not been able, after careful search of their specimens, to confirm the invasion of nuclei by gemmules, with the resulting formation of male gametocytes. They are further not able to satisfy themselves that the gemmules ever invaded nuclei. They have been able to trace a large portion of the secondary cytoplasmic stage, beginning with conjugation and ending with the formation of round or oval bodies, the products of

¹ Jour. of Med. Research, 1904, xi, 173.

² Jour. of Med. Research, 1904, xii, 359.

a definite segmentation or fragmentation. These bodies invade nuclei and are the earliest forms of the primary intranuclear stage of Calkins. They can confirm the whole of the primary intranuclear stage without modification, as well as the secondary intranuclear stage. Their conclusions are clear: 1. The bodies described in the skin-lesions of variola by Councilman and his coworkers represent stages in the life-cycle of a protozoan parasite. 2. We have been able to confirm all the cycle as made out by Calkins, except the invasion of nuclei by gemmules, there going through a stage leading to the formation of male gametocytes. 3. Based on the study of our material, we can recognize a primary and a secondary cytoplasmic and a primary and a secondary intranuclear stage. The end-forms of these stages are: (a) The gemmule; (b) large nucleated forms—the zygote-like body of Calkins; (c) small ring-like spores in both the intranuclear stages. 4. The relation of these parasites to the skin-lesions is of so definite and intimate a character as to lead to the conclusion that they are the cause of the disease.

The Infectiousness of the Blood in Variola.—G. B. Magrath and W. R. Brinkerhoff¹ (Boston) examined the blood of variolous patients, of monkeys inoculated with variolous virus, of normal monkeys, and of individuals not suffering from smallpox, with the result of finding bodies widely diverse in size and somewhat different in structure in the blood of the variolous patients as well as that of the inoculated monkeys. They are somewhat more numerous during the secondary fever than at other times, and in severe than in mild forms of the disease. The blood of the healthy men and the normal monkeys contained a few of these bodies, and in a case of malignant endocarditis they were very numerous. These bodies do not admit of positive identification with any known form of *Cytoryctes variolæ*. They may be accounted for as derivatives or as degeneration-products of blood-corpuscles, as blood-platelets, or in some instances as erythroblasts. The blood of patients with variola, obtained by puncture of the ear, inoculated upon the cornea of the rabbit, does not produce a variolous keratitis. Blood so obtained from a case of purpura variolosa and so inoculated may produce a variolous keratitis, probably because of contamination of the sample by infected epithelium.

Comparative Morphology of Vaccine Bodies.—According to the investigations of J. Ewing,² the inoculation of vaccine and diphtheria toxin in animals produces a peculiar form of coagulation or keratin-necrosis. This results in the formation of homogeneous acidophile material, which may be drawn out into fibrils or broken up into globules or granules. The latter may be vacuolated and surrounded by healthy epithelial cells. This type of necrosis occurs in variola and measles, the bodies produced being abundantly found in the cutaneous lesions. Some of these bodies have been included in the cycles of hypothetical protozoa described by many authors in variola. Ewing does not believe that any of these bodies can be regarded as protozoan forms, but thinks that further investigation is necessary before reaching any definite conclusion.

¹ Jour. of Med. Research 1904, xi, 267.

² Med. News, May 7, 1904, p. 907; Proc. N. Y. Path. Soc.

The Leukocyte Reaction in Variola.—G. B. Magrath, W. R. Brinkerhoff, and I. R. Bancroft¹ (Boston) found a greater or less degree of leukocytosis in all cases of variola. The typical cases of severe variola vera which recover without complications present, at the beginning of the eruption, a normal or subnormal count, which increases with the development of the cutaneous lesions, then suffers a slight decline, rises again during the later stage of the eruption, and finally falls to normal during convalescence. In fatal cases the leukocyte count may be high in the early stage of the eruption, but from then until death it steadily falls. In mild cases there may be no rise above the upper normal limits or a gradually increasing leukocytosis reaching its acme after the lesions of the skin have passed their active stage. Both the primary and the secondary hemorrhagic types show a marked hyperleukocytosis. The leukocytic picture of variola is characterized by an increase in the mononuclear cell types, although the minor variations in the leukocyte-curve are dependent upon fluctuations in the absolute number of polymorphonuclear neutrophils.

Vaccination and Lymph.—E. Levy² (Strassburg) found that fresh, glycerinized calf-lymph produces phlegmonous infections, but that if the lymph is permitted to age to 8 days, these complications do not occur. Staphylococci found in it were harmless when injected into animals, and evidently had their virulence destroyed by the glycerin. Whether the infections are due to virulent organisms introduced through carelessness at the time of manufacture or whether newly manufactured lymph possesses qualities which make it harmful to patients, it follows that the glycerin destroys either, and no lymph should, therefore, be used until 4 weeks old. This has, however, one exception. To revaccinate himself he used 12 and 5 weeks' old cultures, both times without success, and he had the same experience with most other revaccinations, but using 5 days' old cultures he succeeded every time. This is due to glycerin acting as a slow destroyer of vaccine; the higher the temperature, the quicker its immunizing property is destroyed. On this account he advises fresh vaccine in revaccinations, but older lymph for first vaccinations and revaccinations after a long intermission.

On the Infectiousness of the Late Stage of the Skin-lesions in Variola.—These experiments were performed by W. R. Brinkerhoff³ (Boston) to determine the contagiousness of the crust or disk, the final stage of the skin-lesion in variola, and to attempt the isolation and cultivation *in vitro* of the contagium. The disks of 3 of the 5 cases examined gave positive results when inoculated into the cornea in the dry state; from 2 cases the results were negative. Two of the disks were one day old, one 34 days old, and one 88; the 2 negative disks were 1 and 30 days old respectively. Disk paste from a case of variola confluens gave positive reactions in 3 out of 4 inoculations. In disks from clinically mild types of the disease fewer streptococci are grown than from the disks of variola vera. As it is not possible to determine whether the bacteria are from the

¹ Jour. of Med. Research, 1904, xi, 247.

² Münch. med. Woch., 1904, li, 307, No. 7. ³ Jour. of Med. Research, 1904, xi, 284.

outside or inside of the disks, no definite conclusions can be drawn from the bacteriologic findings in the disk serum cultures. In 2 cases it was possible to demonstrate the presence of the contagium by corneal inoculation, but no bacteria could be found. The contagium, therefore, is demonstrable in the disk. By appropriate treatment a product can be obtained from the variola disk, in which the contagium is demonstrable, but in which bacteria are not found. The contagium does not appear to multiply in fresh rabbit-serum or in filtered eye fluid of calves.

Klebs-Löffler Bacilli in Vaccinia.—H. C. Brown¹ has been able to isolate from fresh vaccine lymph a bacillus which resembled, morphologically, the Klebs-Löffler bacillus. He isolated it in pure culture from 3 cases of vaccinia, the lymph used in each case being from a different source. The cases from which the bacillus was obtained ran an uncomplicated course.

Protozoon-like Bodies Found in Scarlet Fever.—In 4 cases of scarlet fever F. B. Mallory² (Boston) found bodies which in their morphology strongly suggest that they may be various stages in the developmental cycle of a protozoan. They occur in and between the epithelial cells of the epidermis and free in the superficial lymph-vessels and spaces of the corium. The great majority of the bodies vary from 2 to 7 μ in diameter, and stain delicately but sharply with methylene-blue. They are made up of a granular substance, with a firm reticulum, and in some cases one or more vacuoles. They form a series of bodies, including the formation of definite rosetts with numerous segments which are closely analogous to the series seen in the asexual development (schizogony) of the malarial parasites, but in addition there are certain coarsely reticulated forms which may represent stages in sporogony or be due to degeneration of the other forms. Later these segments separate from one another, but still maintain a relation to the central body. Mallory believes these bodies to be protozoa and to have an etiologic relation to scarlet fever; he very wisely does not claim that this relation has been proved.

The Presence of Mallory's Cyclaster Scarlatinalis in Scarlet Fever.—C. W. Field³ found the bodies described by Mallory in the skin of 5 individuals who had been suffering from scarlet fever and who had died in the course of the disease. They were demonstrated after hardening in Zenker's fluid and staining with methylene-blue and eosin. They were to be seen in the deeper strata of the epithelium as fine, roset-like formations; and also as intracellular and extracellular bodies. The organisms were not found in sections of skin extirpated during life from 4 scarlet-fever patients. Field does not commit himself concerning the nature of the bodies.

Leishman's and Donovan's Bodies.—Leishman and Donovan recently reported finding small oval bodies in the spleen in cases of low fever, chronic dysentery, and cachexia, and Donovan also found similar ones in chronic malaria. R. Ross⁴ (Liverpool) has investigated these forms, studying the type specimens of Donovan, and finds that it is

¹ Jour. of Path. and Bact., 1904, ix, 154.

² Jour. of Med. Research, 1904, x, 483.

³ Proc. New York Path. Soc., Mar., 1904.

⁴ Brit. Med. Jour., Nov. 14, 1903, ii.

hardly possible to doubt that these are parasites of some kind, probably protozoan. The fever-charts of Donovan's cases recall the chronic pyrexia with enlarged spleen frequently observed in India, and are not a little suggestive of kala-azar.

The Leishman-Donovan Body.—P. Manson and G. C. Low¹ found the Leishman-Donovan bodies in a case of kala-azar; they were present in the spleen, liver, bone-marrow, and mesenteric glands, but not in pancreas, kidney, and intestines.

The Occurrence of Leishman-Donovan Bodies in Cachexial Fevers, Including Kala-azar.—L. Rogers² found the Leishman-Donovan bodies in the blood of 30 patients, presenting the clinical picture of grave malarial cachexia; blood was taken from the spleen by puncture and contained the parasite in 10 of the cases. In 5 malarial organisms were found, while in the other 15 cases the result was a negative one. Rogers found the same bodies in 5 of 6 cases of kala-azar, but was not able to find bodies which he could diagnose as adult trypanosomes. The bodies are small, oval, and have a diameter no greater than one-third that of an erythrocyte. Of the 2 nuclei, the one is small, rod-shaped, and dark, the other larger, rounder, and lighter. Sometimes they are in contact with each other, while at others they are in opposite parts of the body. During the acute stage of the disease they are plentiful in the blood, or they may be found within polymorphonuclear leukocytes, where they may show signs of degeneration. Sometimes they are arranged in small groups, while at others not two of them seem to be together (sporulation).

Note on the Lymphatic Glands in Sleeping-sickness.—D. W. Greig and A. C. H. Gray³ found trypanosomes in the fluid taken from the lymph-glands of 15 patients suffering from sleeping-disease; the cervical glands contained the largest number. The blood and the cerebrospinal fluid were found to contain them also, but in smaller numbers. As many of the trypanosomes were in various states of degeneration, the authors believe that the parasites die in the lymph-glands. They found no streptococci; peculiar is the presence of a lymphocytosis inasmuch as the total number of leukocytes was perfectly normal. They also found the trypanosomes in the puncture fluid derived from cervical glands of 5 ordinary cases of trypanosomiasis; they are of the opinion, therefore, that the diseases are in reality one, the sleeping-disease being simply an early stage of trypanosomiasis.

Protozoa in a Case of Tropical Ulcer (Delhi Sore).—J. H. Wright⁴ (Boston) found the lesion of a Delhi sore to consist essentially of a very extensive infiltration of the corium and papillas by cells, accompanied by atrophy and disappearance of the epidermis of the part. The cells are plasma, lymph, and endothelial cells. Nearly all the cells are filled with microorganisms. He proposes the name of *Helcosoma tropicum* for the organisms, which he considers to belong to the protozoa.

¹ Brit. Med. Jour., May 28, 1904, i.

² Brit. Med. Jour., May 28, 1904, i.

³ Brit. Med. Jour., May 28, 1904.

⁴ Jour. of Med. Research, 1904, x, 472.

Aspergillus in Pellagra.—K. Ziegler¹ has succeeded in demonstrating the presence of the aspergillus in 21 out of 28 cases of pellagra. In a woman dying of pellagra-typhoid the mesenteric glands, which were enlarged and copper-red in color, yielded *Aspergillus fumigatus* on culture. No mention is made of the demonstration of the spores in sections. Ziegler believes that an attenuation of the aspergillus-spores takes place in the animal-organism, and that this is one reason why, in a number of instances, cultures have been negative; but even these attenuated spores possess marked toxic properties. The negative cultural results in patients dying of acute pellagra do not prove that the aspergillus-spores are absent. Aside from the possibility of their being missed, they may be so attenuated as not to grow artificially.

The Etiology of Hay-fever.—H. Liefmann,² working under Professor Dunbar, has investigated the content of the air in pollen-grains during the months of April, May, and June, in order to determine whether there is any relationship between the disease and the quality and quantity of these grains during the hay-fever months in North Germany. Glass plates coated with a sticky material, as first suggested by Blackley (one part water, one part glycerin, and two parts alcohol), were exposed to currents of air. The pollen-grains on these plates were then counted under the microscope. The results of this investigation seem to bear out the pollen-theory of hay-fever. They show, in the first place, that the commencement of the hay-fever season coincides with the appearance of pollen-grains of the Graminacæ, and that the two disappear coincidentally; secondly, that the factors that influence the pollen-content of the air likewise control the clinical picture of the disease, so that the pollen-curve of the air corresponds with the general curve of the disease; thirdly, that from a quantitative point of view the number of pollen-grains found in the air seems entirely adequate to produce the symptoms of hay-fever.

Etiology and Pathogenesis of Blackwater Fever.—A. Plehn³ claims that blackwater fever is always of malarial origin. It occurs most frequently in equatorial climates, where the disease is most virulent. Its development is promoted by an uninterrupted action of the malarial virus on the organism, no opportunity being given to the system to recover between attacks. The hemoglobinuria is produced by an acute destruction of the red blood-corpuscles, the infected cells being the first to disintegrate. There are two factors of importance in the development of blackwater fever—the disposition and the immediate cause that produces the acute hemolysis. The disposition to hemoglobinuria consists in a diminished resistance of the red corpuscles and an unstable condition of the nervous system affecting the renal function. The exciting cause of the hemolysis may be the administration of quinin or of some other drug (salipyrin, phenacetin, and methylene-blue have produced it), an attack of malaria

¹ Cent. f. allg. Path. u. path. Anat., July 6, 1903, Bd. xiv, p. 465.

² Zeit. f. Hyg. u. Infectiönsk., June 24, 1904, Bd. xlvii, Heft 2.

³ Virchow's Arch., 1903, Bd. clxxiv, Heft 3, S. 509.

itself, or exposure, overexertion, etc. Regarding the action of quinin in blackwater fever, Plehn believes that the inefficiency of this drug is due to its poisonous effect on the blood. There are numerous cases of blackwater fever, however, which cannot possibly be traced to quinin as the exciting cause. And there is no doubt that many cases are prevented by the prompt administration of the drug early in an attack of malaria.

TUMORS.

Parasitic Origin of Cancer.—According to the investigations of T. Honda,¹ the supposed parasitic structures found by Plimmer, Gaylord, Feinberg, and probably those of von Leyden are all of the same nature, the apparent differences being due to different methods. Among cancers these structures are found only in glandular carcinoma; rarely in other neoplasms and in inflammatory conditions. This fact is evidence against their parasitic nature, as is also the want of relation between their paucity and the great proliferating powers of the cancer cells. The nature of these bodies is not clear, but they probably arise from a secretion of hyaline matter into the cell-protoplasm or from a hyaline degeneration of the cell. Honda was not able to duplicate Feinberg's results with the Romanowski method. He declares that he will accept the parasitic etiology of cancer only when it can be shown that the parasite in question will produce carcinoma.

Transmissibility of Cancer.—J. Dagonet² reports a case of experimental transmission of cancer. An involved lymphatic gland from a case of cancer of the penis was crushed and emulsified with sterilized water. Of this emulsion, 2 cc. were injected into the peritoneal cavity of a white rat. There were no immediate effects, but the animal became progressively emaciated and died after 15 months. The omentum, spleen, and liver were found to be the seat of cancerous growths. Histologic examination showed these growths to be of the same nature as the original tumor of the penis, namely, a squamous epithelioma with keratohyaline degeneration.

An Internal Network in Cancer-cells.—By the silver chromate reaction J. Moriani³ was able to demonstrate in cancer-cells a more or less complicated network, resembling that found by Golgi and his followers in normal cells of various tissues. The network is made up of coarse, irregular threads, and its outer boundaries are separated from the periphery of the cell by a clear protoplasmic zone. This phenomenon was found only in secondary carcinoma nodules; the primary tumors gave the reaction either very faintly or not at all.

Myeloma.—R. Hoffmann⁴ reports a case of typical multiple myeloma with metastases to the liver. He distinguishes 3 kinds of tumor-cells: (1) Large cells, with one or more round or oval nuclei placed at the periphery, and the chromatin frequently collected around the nucleus;

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 1, S. 96.

² Arch. de Méd., 1904, t. xvi, No. 3, p. 345.

³ Ziegler's Beit., 1904, Bd. xxxv, Heft 3, S. 627.

⁴ Ziegler's Beit., 1904, Bd. xxxv, Heft 2, S. 317.

(2) small cells, with nuclei the size of the former, and a scanty cytoplasm, collected at the periphery of the cell; (3) cells with sharply drawn boundaries, staining deeply, with the morphologic properties of the first class. Hoffmann regards the second variety as daughter-cells of the first, and the third as degenerating cells. The characteristics of these cells classify them with the so-called plasma-cells, which he considers to be related genetically to the lymphocytes. The term "plasmoma" may, therefore, be applied to this variety of myeloma, characterized by a hyperplasia of this special cellular element of the bone-marrow. In a wider sense the term may also be employed to denote circumscribed accumulations of plasma cells in other tissues.

S. Saltykow¹ reports a typical case of multiple myeloma in a woman who had died of chronic nephritis. Four large tumors were found in the ribs, and numerous small ones in the dorsal vertebrae. They were circumscribed, and presented a red color, owing to the presence of large blood-spaces. This red color is probably present in the earlier stages, as tumors from more advanced cases usually present a grayish appearance. The growths were made up of larger or smaller cells, rounded or slightly angular, resembling the myelocytes of red bone-marrow. Examination of the blood taken from various organs showed a marked increase in the myelocytes.

The case described by A. J. Abrikossoff² was admitted to the hospital complaining of severe cough with expectoration, pains in the sides and beneath the ensiform, and general prostration. The pains continued to appear in various parts of the body, and tender swellings arose in the clavicles, sternum, ribs, and spinal column. Pleurisy developed, and the patient finally died with symptoms of gradual weakening of the heart's action. At autopsy the bones of the chest, spinal column, and both humeri were found to be the seat of malignant growths, which destroyed the bone and infiltrated the surrounding tissues. The tumors had their origin in the marrow of the bones, and were made up of cells that resembled the myelocytes of the marrow, except that they were a little larger. Lymphocytes and red blood-corpuscles also occurred, all the cells being embedded in a delicate supporting tissue, which was arranged in bundles at times. The impression conveyed was that under the influence of certain conditions the myelocytes of the bone-marrow had received an impulse to multiply and form a tissue with tendencies to progressive growth. But there is no reason to suppose that a simple hyperplasia would be able to destroy the bone-tissue and infiltrate surrounding parts. In most cases of multiple myeloma—not in the one here reported, however—the growths are more or less circumscribed. It is probable that all cases described in literature under the names of primary multiple round-cell sarcoma, primary multiple lymphosarcoma, and multiple myeloma, belong to the same group of tumors. The following conclusions may be drawn concerning the pathologic anatomy of these multiple bone-marrow tumors: (1) They occur most frequently in the

¹ Virchow's Arch., Bd. clxxiii, Heft 3, S. 531.

² Virchow's Arch., Bd. clxxiii, Heft 2, S. 335.

bones of the trunk. (2) They arise from the bone-marrow, either as sharply circumscribed nodes or as a more or less diffuse involvement of the marrow. (3) In rare cases they may be classed with the endotheliomas, according to their structure. (4) In most cases the structure resembles that of lymphadenoid tissue. (5) The tissue of some tumors closely resembles that of the original bone-marrow; while in other cases the histologic appearance is quite different, either as a result of the sharp circumscription of some nodes, or because of the presence of spindle-cells or giant-cells. (6) In all cases the newgrowth acts in a destructive manner on the bone and surrounding soft parts.

H. Ribbert's¹ case of myeloma was that of a man, 42 years of age, in whom a diagnosis of sarcomatosis of the head, with metastases to the vertebral column, had been made. Autopsy showed the existence of a myeloma affecting especially the skull, the vertebral column, and the ribs. The largest tumor was situated on the first left rib. All the tumors were reddish or brownish-red, and some appeared to be hemorrhagic. Ribbert is of the opinion that the tumor on the first rib was the primary one, the others being metastatic. Microscopically the growths were composed of cells having a slightly yellowish color, like erythrocytes, and also staining like the latter. All grades between colorless and colored, or hemoglobin-containing, cells could be found. He thinks that the hemoglobin-containing cells have the value of nucleated red corpuscles or megaloblasts; and that the tumors are really composed of a specific cell, just as the lipoma is made up of fat-cells and the lymphocytoma of lymphoid cells. He proposes the name of erythrocytoma—or, rather, erythroblastoma—for myeloma. As to their origin, he believes that they are developed from embryonal rests composed of the antecedents of the red corpuscles; and that when once a primary tumor has developed from these, the metastasis is easily explained, although it is possible that there may be several rests giving rise to tumors.

A Tumor of the Pleura Arising from Aberrant Pulmonary Tissue.

—N. Muus² describes a smooth, polypoid tumor extending into the left pleural cavity from the upper surface of the diaphragm. The pedicle penetrated the latter organ and was inserted into the wall of the stomach. Section of the tumor showed a spongy tissue covered by the pleura. The structure resembled that of normal embryonal lung, consisting of connective tissue, cartilage, elastic fibers, and ciliated cylindric epithelium. The tumor is explained as being the development of a part of the embryonal lungs, which had become separated from the main mass and had been moved backward by the growth of the gastro-intestinal tract.

Papillary Epithelioma.—L. Schwarz³ reports a case characterized by the development of a tumor of the skin over the occipital protuberance. When microscopically examined, this tumor proved to be an epithelioma of papillary character. It was further characterized by the development of horny tissue and of partial calcification. Inflammatory

¹ Cent. f. allg. Path. u. path. Anat., May 15, 1904, Bd. xv, No. 9.

² Virchow's Arch., 1904, Bd. clxxvi, Heft 1, S. 180.

³ Virchow's Arch., 1904, Bd. clxxv, Heft 3, S. 507.

processes had led to extensive organization, and had thus produced a partial cure. Numerous giant-cells were found, partly of connective-tissue origin and partly of epithelial nature. The tumor had probably been an atheroma originally, as a number of these growths were found distributed over the remainder of the scalp.

Chorioepithelioma Arising Outside the Placental Site.—O. Busse¹ reports 2 such cases. In the first case the apparently primary tumor was found in the left ventricle of the heart and its walls, with metastases in the brain, lungs, spleen, kidneys, liver, and intestines. There was not the slightest indication of a tumor in the uterus, but the woman had aborted 6 months previously. In the second case the primary tumor arose during a pregnancy in the right parametrium and posterior vaginal wall. The histology in both cases was that of typical chorioepithelioma, the syncytial cells predominating in the first tumor, while those of Langhans's cellular layer were most prominent in the second. Another characteristic feature was the tendency of the tumor to spread by means of the circulatory system, to penetrate the walls of the bloodvessels from within outward, and thus give rise to hemorrhages.

Primary Multiple Alveolar Angiosarcoma of the Liver in a 4 Months' Old Child.—This rare case is reported by J. de Haan.² On section, the liver showed numerous blood-filled cysts. There was hardly any normal hepatic tissue to be seen, its place being taken by rounded areas of varying size, exhibiting a grayish color with dark centers. Microscopic examination showed a network of dilated capillaries, containing in its meshes numerous small, round, sarcoma cells. The endothelium of the vessels was swollen; the cells assumed a more or less rounded form, and closely resembled the tumor-cells. Hemorrhages were found in most of the larger tumors.

Perithelioma of Luschka's Sacral Gland in Childhood.—M. von Hleb-Koszanska³ reports the case of a child having a rounded tumor just above the anus. Microscopically this was seen to have an alveolar structure, arising from a very complex vascular arrangement, resembling that of the sacral gland. The alveoli could be divided into 4 types: (1) The tumor-cells are arranged in concentric or radiating lines around one, two, or more central vessels. (2) The bloodvessels form a peculiarly branched network, surrounded by one or more layers of tumor-cells. (3) The alveolus is surrounded almost completely by a bloodvessel, and is separated from the tumor-mass by a zone of connective tissue. (4) A few alveoli seem to have no connection with bloodvessels, and are composed altogether of tumor-cells. The tumor, therefore, evidently had its origin in the perivascular perithelial cells, and is probably related to the angiosarcomas. The vascular part of the tumor is simply an exaggeration of the complex network of bloodvessels which makes up the normal sacral gland.

Histologic Studies of Xanthoma.—J. McFarland and G. McConnel⁴

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 2, S. 207.

² Ziegler's Beit., 1903, Bd. xxxiv, Heft 2, S. 215.

³ Ziegler's Beit., 1904, Bd. xxxv, Heft 3, S. 589.

⁴ Jour. of Med. Research, 1904, xii, 69.

(Philadelphia) publish a careful histologic description of a xanthoma. The changes observed in the epidermis were atrophic in nature, and most of these were in the rete mucosum; in one spot there was parenchymatous degeneration of the cells of the rete. The papillary layer was also in a state of partial atrophy, and in places it was invaded by a new variety of cells which they speak of as xanthoma cells. They were much more plentiful in the reticular layer, which was penetrated by them in the form of septums. They were large in size, resembling the cells of sebaceous glands in shape, transparency, nucleus, and number of fat-droplets in the cytoplasm. The central portions of the masses of cells were the oldest and were the largest of the cells; peripherally they contained fewer oil-droplets than elsewhere. The subcutaneous structures were normal. Hair-follicles and sweat-glands were normal, but the xanthoma cells seemed to be especially plentiful in the neighborhood of the sweat-glands. There were no sebaceous glands in any of the sections examined, which is a striking feature of the disease. New capillaries were found throughout the tumor. Concerning the histogenesis of the xanthoma cells they believe them to arise from the cells of the sebaceous glands; the fat- and oil-droplets found in them are believed to be formed in the cells themselves.

MISCELLANEOUS.

Origin of Plasma Cells.—This is the name given by Unna to the peculiarly formed cells with abundant protoplasm which are found in the connective tissue of the skin in chronic infectious processes of that tissue. According to L. Ehrlich,¹ a well-developed plasma-cell contains granoplasm, spongioplasm, nucleus, and nuclear bodies. The granoplasm is usually developed to a greater degree than the spongioplasm. There may be one or two nuclei, each containing 5 to 8 chromatin bodies, arranged radially around the central nucleoli. Plasma-cells proliferate by direct division without mitosis. There are two theories as to the origin of these cells: (1) the histiogenic theory, that they arise from the connective tissue; (2) the hematogenic theory, that they arise from the lymphocytes of the blood. According to Ehrlich, the second theory cannot be maintained nowadays. On the other hand, he has succeeded in demonstrating the origin of plasma-cells from connective-tissue cells. He regards them as connective-tissue cells showing a one-sided hypertrophy—*i. e.* the granoplasm is increased in amount much more than the spongioplasm. They arise from connective-tissue cells showing a general hypertrophy—*i. e.*, the normal ratio between granoplasm and spongioplasm is maintained. Four forms of cells may be distinguished: (1) spindle-formed cells; (2) spider-cells; (3) leaf-shaped or flat cells; (4) winged cells. From these various forms arise transitional varieties which develop into the plasma-cells.

Histogenesis of Giant-cells.—In a tuberculous tumor of the vocal cord J. Schleifstein² was able to demonstrate the probable origin of a certain form of giant-cell. According to his investigations, the tuber-

¹ Virchow's Arch., 1904, Bd. clxxv, Heft 2, S. 198.

² Virchow's Arch., 1904, Bd. clxxv, Heft 3, S. 534.

cular toxin caused degenerative changes in the endothelium of the blood-vessels, by which the cell-bodies were converted into horny masses, while the resistant nuclei remained unchanged for a longer time. The red corpuscles and leukocytes, inclosed in the vessels, likewise underwent a horny degeneration, and combined with the endothelial cells to form a homogeneous horny mass on the periphery of which the nuclei of the cells still remained unchanged.

Histologic Investigations of Osteomalacic Bones.—From a study of 4 cases, Y. Tashiro¹ concludes that in osteomalacia there are 2 forms of bone changes—a halisteric absorption of bone, on the one hand, and a formation of osteoid tissue, on the other hand. Lacunar absorption of bone by osteoclasts is also observed, but this has no connection with the disease in question. The influences which cause decalcification cannot be determined from histologic investigation. The new formation of osteoid tissue is started by a proliferation of the endosteum, and sometimes the periosteum, which produces a fibrillar connective tissue that displaces the medullary tissue. This ground-substance undergoes a thickening in the region of the future osseous tissue, becomes denser or more or less hyaline, and gradually assumes the appearance of the ground-substance of bone. These newly formed osteoid columns may remain uncalcified for some time. Tashiro believes that this osteoplastic tendency is not a secondary phenomenon, as some maintain, but is to be considered as a part of the osteomalacic process.

The Significance of Glycogen in Inflammation and Suppuration.—The investigations of the glycogen reaction in inflammatory conditions have previously been carried out on blood and dried pus preparations. Best² examined the tissues themselves in various stages of inflammation for this reaction. In hardened preparations of such tissues he found that certain contained granules, globules, and flakes gave the iodine reaction. In the normal body these are found principally in striated muscle and the liver. Under pathologic conditions they occur in tumors and inflamed tissues. All these bodies belong to a chemically identical group; besides giving the iodine reaction, they are soluble in saliva and diluted acids, are uninfluenced by nuclear and diffuse stains, but are stained by a special carmin method. The fundamental chemie substance contains glycogen, but in an unknown modification—probably a proteid combination. It is found in almost all malignant tumors, but has no relation to the malignity. It is also a constituent of the polynuclear leukocytes, and of tissue and tissue-cells in acute inflammations, to a less extent in chronic inflammatory conditions. It arises as a reaction to the influence of positively chemotactic substances and bacterial toxins. It is not a sign of degeneration, but rather of heightened cellular activity. What significance it has for the inflammatory process is still to be explained.

A Method for the Preservation of Anatomic Preparations.—The method described by M. Claudius³ has in view the preservation of the

¹ Ziegler's *Beit.*, 1903, Bd. xxxiv, Heft 2, S. 220.

² Ziegler's *Beit.*, 1903, Bd. xxxiii, Heft 3, S. 585.

³ Virchow's *Arch.*, 1903, Bd. clxxiv, Heft 1, S. 193.

natural color in anatomic preparations. This depends upon the preservation of the hemoglobin, and is accomplished by the formation of the stable carbon monoxid combination with hemoglobin. The impregnation of the tissues with carbon monoxid gas is done in an air-tight metal cylinder, partly filled with a saturated solution of ammonium sulfate. The latter hardens the preparation and also aids in the preservation of the color. After impregnation and hardening the specimens are preserved in glass jars filled with the saturated ammonium sulfate solution.

Staining Bacteria in Sections.—K. Ziegler¹ recommends the following method for staining bacteria that are not easily stained in sections, such as the glanders and typhoid bacilli, the gonococcus, etc.: 1. Fixation and hardening, as may be convenient (best, formol—Müller—with osmic acid); embedding in paraffin or in celloidin. 2. Staining overnight in weak orcein solution: Orcein D (Grübler), 0.1; nitric acid, 2.0; 70 % alcohol, 100.0. 3. Rinsing in 70 % alcohol. 4. Water. 5. Staining in polychromethylene-blue, 10 minutes to 2 hours. 6. Water. 7. Differentiation in glycerin-ether mixture of Grübler. 8. Distilled water. 9. Alcohol (70 %), absolute alcohol, xylol, and balsam.

Cryoscopy of Animal Organs, with Special Reference to the Determination of the Freezing-point of the Kidneys.—Blanck² finds that the freezing-point of renal tissue is approximately the same in both kidneys. In various animals experimented upon it lies between -0.86° and -1.35° C. Washing out the kidneys with plain water will affect the freezing-point to a slight degree, while alkaline water has a greater effect. Stimulation of the secretory activity by diuretin or agurin has considerable influence. All these substances act by diminishing the osmotic tension of the kidneys. On the other hand, phloridzin has no effect on the freezing-point; changes in the renal substance, produced by potassium chromate or stagnation of urine, likewise are without influence.

Action of the Purin Substances.—J. Walker Hall³ gives the results of his experiments with the prolonged administration of moderate doses of the purin-substances (guanin, hypoxanthin, uric acid). His results as to the blood-pressure contradict those of Croftan. Hall finds that repeated injections of hypoxanthin causes no rise in blood-pressure. On the other hand, degenerative changes are produced in the kidneys and liver. In the blood there is found an increase in the lymphocytes and multinuclear leukocytes, with a marked increase of the basophile cells. Corresponding changes occur in the bone-marrow. These experiments are in line with the theory as to the chemic origin of the organic changes in interstitial nephritis.

The same author⁴ determined the quantitative excretion of purin-bodies by the feces, the absorption quotients of the several purin-bases, and the output of fecal purins in morbid conditions. He found

¹ Cent. f. allg. Path. u. path. Anat., July 6, 1903, Bd. xiv, p. 561.

² Virchow's Arch., 1903, Bd. clxxiv, Heft 2, S. 366.

³ Virchow's Arch., 1903, Bd. clxxiv, Heft 2, S. 359.

⁴ Jour. Path. and Bact., 1904, ix, 246.

that the fecal purins show an average daily excretion in the same individual at different intervals and under similar circumstances, and that the quantity ranges from 0.01 to 0.03 gram of purin-nitrogen on a mixed diet. The addition of medium quantities of meat and hypoxanthin did not alter the normal amount, and they are, therefore, probably fully absorbed. When excessive amounts of meat, thymus gland, or guanin were added to a mixed diet, a large proportion of their purin-nitrogen was excreted in the feces within the following 24 hours. The increased excretion was due to an increase in the guanin and adenin constituents respectively. The xanthins were slightly increased, but this is probably due to oxidation processes. The fecal purins were determined in diarrhea and rheumatism; in the former of them they were increased. The prescription of sweetbreads to patients the subjects of metabolic disorders seems justified by the results of the present investigation, which, however, also indicates the limitation of foods containing hypoxanthin and xanthin bodies. The fecal purins originate from shed nuclein, bacteria, and intestinal secretions. The nuclein is to some extent decomposed in the alimentary canal; the resultant adenin and guanin may be excreted as such or be oxidized to xanthin and hypoxanthin.

HEMOLYSINS; CYTOLYSINS; ANTITOXINS.

Contribution to the Study of Hemoagglutinins and Hemolysin.—

To note the part played by the different portions of the red corpuscle, the stroma, hemoglobin, or cellular contents, in the production of agglutinins and lysins for the erythrocytes of other animals, to control the contradictory results of Bordet and Nolf and the imperfectly concluded experiments of van Dungen and Leblanc, W. W. Ford and J. T. Halsy¹ (Baltimore) performed a series of experiments; they injected rabbit's erythrocytes into guineapigs, and hen's erythrocytes into rabbits, separating the components by special methods which they describe. They duplicated all their work before drawing the following conclusions: 1. The employment of the constituents of the blood-corpuscles of one species of animals, laked blood and stroma for the injection of other species of animals, results in the production of definite specific bodies—lysin and agglutinin. 2. In a strongly hemolytic serum the rapid solution of the corpuscles masks the appearance of the agglutination, which may be demonstrated in preparations kept on ice at 3° C. or by the use of inactivated serum. 3. In an immune-serum capable of uniting in high dilutions with the erythrocytes originally employed the lysis in these dilutions is frequently absent, even though agglutination takes place, owing to the lack of sufficient complement in the diluted serum. The addition of an excess of complement in the shape of fresh normal serum always suffices to cause the solution of the corpuscles in the same dilutions in which they are agglutinated. 4. Bordet's view that the stroma is responsible for the agglutination and the laked blood for the lysis are both confirmed by the demonstration of both agglutination and lysis

¹ Jour. of Med. Research, 1904, xi, 403.

from the injection of both laked blood and stroma. 5. Contrary to van Dungen's view, the splitting-up of the blood-corpuscles by the use of distilled water does not result in the destruction of the substances in the corpuscle producing lysis and agglutination. 6. The phenomena of agglutination and lysis cannot be separated from each other by the injection of the constituents of the blood-corpuscle, but these phenomena seem to be inseparably connected.

Concerning the Specificity of the Somatogenic Cytotoxins.—R. M. Pearce¹ (Albany) undertook his study to demonstrate, by a comparative study of the somatogenic cytotoxins, that the action of any given cytotoxin depends on the chemic (receptor) organization of the cell, and not upon morphologic characteristics; that an artificial antiserum may have a definite toxic action on several cells of widely differing morphology, but presumably having in part, at least, common receptors; that specificity in the sense of morphologic affinity is of secondary importance, and in the case of some serums may not exist; that many of the results supposed to be due to the specific action of one cytotoxin are due rather to other cytotoxins adventitiously elaborated as the result of improper methods of immunization. The dog and the rabbit were the animals selected for the experiments, the latter being immunized with the cells and fluids of the former. The immunizing fluids used were defibrinated and washed blood; the serum of unwashed organs, such as the kidney, liver, pancreas, and adrenals; washed serums of the same organs; and serums prepared by injecting blood-serum, bile, and urine. These experiments have shown that the cells of the various organs of the body, while differing in morphology and function, have certain receptor characteristics in common, and that one type of cell may, therefore, produce antibodies affecting several cells of differing morphology, but with like receptor groups. All the serums from the washed organs agglutinate and hemolyze red corpuscles, and may cause degenerative changes in liver and kidney. Some of the cytotoxic serums have no effect upon organs for which they are supposed to have a morphologic affinity, but exert a powerful lytic influence upon other cells. Aside from nephrotoxin, which has a distinct action on renal epithelium, the various cytotoxins studied have no specific action in the morphologic sense. The nephrotoxic element is combined with hemolysin, thus depriving it of the term specific; it may be termed a "special" serum. Pancreas and adrenal serum are devoid even of special action; and the lesions of so-called hepatotoxins are doubtful and may be produced by other serums. The striking characteristic of adrenal serum is its powerful hemolysin. The presence of free receptors in the various body-fluids is shown by the appearance of antibodies in the serum of animals receiving serum, bile, and urine; the diverse character of these receptors by the variety of cytotoxins thus formed. These observations offer strong support of the view that specificity is a function of receptors and not of cells. The results obtained with serums from blood and blood-containing organs and described as specific of certain cytotoxins are due rather to hemoagglutinin and hemolysin formed

¹ Jour. of Med. Research, 1904, xii, 1.

as the result of impure methods of immunization. It is also necessary to differentiate between the primary action on red blood-cells of hemolysin and the secondary action upon other cells, as those of the kidney, which are due to toxic hemoglobin derivatives. The part played by hemoagglutinin, which is present in all the serums studied and in some causes the formation of red blood-corpuscles, thrombi, and a mechanic disturbance of the circulation leading to degeneration, necrosis, and hemorrhage, should not be disregarded. This action is best illustrated by antibile serum; it has no hemolytic, but a powerful agglutinating, activity. The lesions which it produces have been confounded with the action of the cytolytic constituent of a serum, and have been considered a specific, while they are really due to the simpler agglutinating body.

The Relationship of Leukocytes and Certain Organ Extracts to the Bacteriolytic Power of the Blood.—The experiments of G. F. Petrie¹ (Aberdeen) were made for the purpose of obtaining answers to the following questions: 1. Do the fresh intracellular products of polynuclear leukocytes contain bactericidal substances? 2. Does the bacteriolytic agent in blood-serum owe its powers to substances originating in the leukocytes? In other words, it is possible that the white cells contain a complement which, when added to a normal serum inactivated by heat, is able to restore its bactericidal action? Ordinary leukocytes were tested, and also leukocytes of rabbits the natural resistance of which toward *Bacillus typhosus* had been increased by a previous immunization, and, lastly, leukocytes of dogs were studied in relation to *Bacillus anthracis*, inasmuch as dogs are immune to anthrax. The following abstract of the results represents the conclusions which he drew from his experiments: 1. No bactericidal substance for *Bacillus typhosus*, *Bacillus coli*, or *Bacillus enteritidis* (Gärtner) exists in any of the varieties of leukocytes obtained from the normal adult rabbit. 2. No complement capable of reactivating cell-free exudate or serum of the normal rabbit can be shown to be present within the polynuclear leukocytes. 3. A mixture of polynuclear and mononuclear leukocytes has proved equally inactive. 4. No substance reactivating a typhoid immune-serum of the rabbit can be demonstrated in the polynuclear leukocytes of the normal rabbit. 5. Even in the case of rabbits which have been previously immunized with typhoid cultures the leukocytes are similarly found to be devoid of any bacteriolytic or reactivating power; this also holds good in animals immunized against coli and cholera cultures. 6. The cell-free exudate of normal rabbits is bactericidal toward *Bacillus typhosus*, but this action is not so marked as in the case of the corresponding serum. 7. Rabbit-serum is invariably powerfully bactericidal toward typhoid bacilli, but not toward *Bacillus enteritidis* (Gärtner). 8. The cells of the spleen and liver of the normal rabbit are incapable of acting as a substitute for the bacteriolytic complement of its serum. 9. The polynuclear leukocytes of the dog, examined for the presence of a bactericidal substance for anthrax bacilli, give negative results. 10. These cells are not even able to furnish a complement to the serum of the dog, which will

¹ Jour. of Path. and Bact., 1904, ix, 130.

render it bactericidal toward anthrax bacilli. 11. The intracellular products of the spleen, liver, and bone-marrow of the normal dog, when added to its serum, fail to impart to it a bacteriolytic action.

A Clinical Study of the Hemolytic Action of Human Blood-serum.—The careful experiments of J. M. Polk¹ (New York) were performed for the purpose of determining the hemolytic power of the blood-serum in disease as compared with the normal blood-serum. Lobar pneumonia gave a high degree of hemolysis, which was increased by complication. Alcoholic cases gave high figures. Coryza and acute and chronic bronchitis gave results varying within normal limits; tonsillitis and influenza gave high figures. Pulmonary tuberculosis gave figures midway between bronchitis and pneumonia. In septic conditions normal degrees of hemolysis prevailed; typhoid fever gave a high figure and malaria a low one. Acute articular rheumatism, arthritis deformans, and gout showed high degrees of hemolysis. In cardiac conditions no variation from the normal was seen. In severe nephritis, and especially when complicated with anemia, low degrees of hemolysis existed; the same was true of hepatic diseases. Diabetes gave uniformly high figures. All anemias, primary and secondary, gave low degrees of hemolysis. The most definite results of this study are the low hemolytic action of the serum in severe anemia, the increase of the property in most infectious diseases, and the striking increase in diabetes.

Hemolysins in Animals Deprived of the Spleen.—After removing the spleens of animals Jakuschewitsch² (Charkow) found that the number of red corpuscles diminishes, the leukocytes, especially the lymphocytes, increase, hemoglobin diminishes, regeneration of blood after a venesection is retarded, and the blood-forming power of the bone-marrow is increased. After immunization of the animals the hemolytic value of the serum of the operated animals, as well as that of the others, rose considerably, but the value was always greater in the operated animal than in the control. It did not seem to make any difference in the value of the serum whether the immunization was begun on the third day after the operation or on the twentieth or the thirtieth. From this it can be gleaned that the formation of hemolysins cannot be credited altogether to the function of the spleen; he considers the increase to be due to heightened activity of the bone-marrow and the increase in the number of leukocytes.

Action of the Hemolytic Toxins in the Organism.—Y. Fukuhara³ finds that hemolytic serum has almost the same action in the organism as in the test-tube; the so-called plasmolysis of the erythrocytes, however, occurs only in the living body. The circulating hemolysins, which do not combine with the blood-cells, are excreted into the urine. So-called regenerative forms of blood-corpuscles are found in the blood very soon after the injection of the hemolytic serum. The acute death, without visible pathologic changes, which follows poisoning with large amounts of

¹ Jour. of Med. Research, 1904, xii, 263.

² Zeit. f. Hyg. u. Infectiousk., 1904, xlvii, 408.

³ Ziegler's Beitr., 1904, Bd. xxxv, Heft 2, S. 434.

serum is probably due to a general action of the poisons on various forms of cellular protoplasm; the toxic action of the hemolysins is not specific in such cases. Hemolytic serum has the same effect within the organism as other hemolytic blood-poisons. The changes produced by it are coagulation of the blood, with thrombosis of the vessels, hemorrhages, ulceration of the stomach and intestines, hemoglobinemia, icterus, pigment deposits in various organs. The hemorrhages into the renal cortex and heart muscle are probably due to the action of thermolabile poisons, as they are not produced by serums which have been rendered inactive by heat. Small necrotic foci are frequently found in the liver after injection of hemolytic serum. Progressive changes and degeneration are also found in the cells of the bone-marrow. The same changes and lesions may be produced by intravascular injection of blood-corpuscles from another species or by bile. The action of cytolytic serums is therefore not a specific one, strictly speaking, as other tissues besides the blood-corpuscles are affected by them.

The Polyvalence of Antistreptococcic Serum.—J. de Piasetzak¹ finds that antistreptococcic serum from the rabbit will agglutinate homologous streptococci perfectly; but heterologous serums rarely produce a complete action, the agglutination being more frequently incomplete or absent altogether. *In vitro* the bactericidal power of homologous antistreptococcic serums is sufficiently pronounced; it is considerably augmented by the addition of leukocytes. On the other hand, heterologous serums are inactive, either with or without leukocytes. The experiences *in vivo* correspond with those *in vitro*; while homologous serums will produce recovery in infected rabbits, the heterologous serums remain inactive, even in powerful doses. The antistreptococcic serum from the horse is also bactericidal, but to a lesser degree than that from the rabbit. A serum that is very active against one type of streptococcus may be absolutely inactive or feebly active against another species. If an animal is immunized with several species of streptococcus, its serum becomes active, not only against those species employed in immunization, but also against other varieties.

Investigations Concerning Microbic Poisons.—Bacterial toxins are divided into 2 classes: (1) Those which are readily soluble in the bodily fluids, and are carried throughout the system, producing the general symptoms of the disease; (2) those which are comparatively insoluble, which adhere to the bodies of the bacteria, and are responsible for the local manifestations of the disease. The investigations of J. Auclair² concern principally the latter class. They are more or less soluble in ether. When injected into cellular tissue or into the lungs by intratracheal injection, they produce the characteristic lesions of the corresponding organisms—erysipelatous dermatitis, foci of suppuration, false fibrinous membranes, bronchopneumonia, etc. Concerning the mode of action of bacteria, these experiments show that the cellular reactions are not the result of the vital action of the organisms themselves, but are produced by

¹ Arch. de Méd., 1903, t. xv, No. 5, p. 589.

² Arch. de Méd., 1903, t. xv, No. 6, p. 725.

the action of special toxins. Concerning the differentiation of bacteria, the investigations show that this can be readily accomplished by the study of the action of their respective toxins. Concerning immunity, it is shown that these toxins are probably the agents which are most intimately concerned in its production, since they incite the cells of the body to action.

Action of the Toxin and Antitoxin of Diphtheria on the Blood and Hematopoietic Organs.—L. G. Simon¹ finds that the injection of a fatal dose of the diphtheria-toxin produces a widespread and rapid degeneration of all the hematopoietic tissues. The injection of small doses, which permit of a spontaneous recovery, produces at first the destruction of a certain number of cellular elements of the blood, especially the polynuclear neutrophiles. The débris is absorbed by the phagocytes of the deep organs. This is the stage of hypoleukocytosis which immediately follows the injection. Against this destruction the organism reacts by an overproduction of the same elements, which results in the stage of hyperleukocytosis. During convalescence the excess of cells is destroyed by the phagocytes. This destruction affects especially the red corpuscles, and the resulting anemia is compensated for by an overproduction of nucleated red corpuscles in the bone-marrow. The injection of antidiphtheric serum alone produces the same modifications which follow the injection of small doses of the toxin. The cycle of reaction, however, is shorter. In the course of a case of diphtheria the therapeutic injection of antitoxic serum produces a superposition of its effects on that of the diphtheric toxin—*i. e.*, it causes a fresh, but mild, destruction of polynuclear neutrophiles, succeeded by an exaggerated compensation. At the same time a myeloid transformation takes place in the spleen. In severe cases the organism cannot react to the serum, and the cellular proliferation is very slight.

Hemolysins in Human Urine.—The investigations of R. S. Morris² show that, where hypotonicity can be excluded, pernicious anemia is the only disease in which the urine exhibited hemolytic powers. This is a support to the hemolytic theory of pernicious anemia, although no definite relation could be demonstrated between the blood-count and the presence of hemolysins in the urine. The intermittent character of the urinary hemolysis seems to support Warthin's theory as to the cyclic nature of the hemolysis in this disease.

Macroscopic Methods for the Performance of the Grüber-Widal Reaction.—The macroscopic methods employed at different times to obtain the Widal reaction in typhoid fever are: (1) Test with living bouillon cultures; (2) mixing an oese of agar culture with 1 cc. of diluted serum; (3) with formalin-bouillon cultures; (4) Ficker's typhoid diagnosticum (dead typhoid bacilli); (5) a mixture of typhoid bouillon culture with paratyphoid bacilli of both types, killed by means of formalin. The last has been used, as paratyphoid fever will react to typhoid cultures at certain dilutions, but with paratyphoid cultures at higher dilutions. As other infections besides typhoid fever present the Widal reaction at low

¹ Arch. de Méd., 1903, t. xv, No. 6, p. 763.

² Am. Jour. Med. Sci., June, 1904, p. 1026.

dilutions, the reaction should be considered positive for the diagnosis of typhoid fever only if the dilution is at least 1 : 50. To determine which of these is of the greatest value for the physician without laboratory facilities A. Lion¹ (Würzburg) performed a series of experiments under similar conditions. He found that in those methods where living organisms were employed, the disadvantage of unequal growth of cultures had to be dealt with. Some of the cultures were not of the age to make them suitable for the reaction, when other tests showed the reaction to be present. With Ficker's method and the typhoid formalin-culture he could rely on his results; when no precipitate occurred, he knew the test to be negative. Another point in their favor is their lack of infectivity. The reaction, however, occurs later than when living bacteria are employed.

Jaundice and the Grüber-Widal Reaction.—Steinberg² (Breslau) studied the relation existing between jaundice and the agglutinating reaction of the blood-serum of jaundiced patients toward typhoid bacilli. Of his 22 patients, 7 gave a typical reaction, the dilution in these cases being greater than 40; 2 of them had typhoid fever 2 and 30 years before respectively, and they were the only ones possessing a positive reaction at great dilution (160 and 640 respectively); in the other 15 patients' cases either the results were negative or the dilution was less than 40. The causes of the jaundice varied greatly, but it was noticed that in those giving the Widal reaction symptoms of infection coëxisted. He employed the following method to determine the presence of the reaction: He kept the serum culture mixture in the oven at blood-heat for 2 hours and then examined it under the microscope. From his own examinations and a review of the work published he concludes that there is no constant relation between the existence of jaundice and the presence of the Grüber-Widal reaction. As marked obstruction to the flow of bile may exist without giving rise to an agglutination of typhoid bacilli, it cannot be the bile or its constituents which give rise to the reaction when present, and as it is usually present in cases presenting with the jaundice symptoms of infection, it must be the infectious agent, which at the same time produces changes in the blood-serum, this causing an agglutination of the typhoid bacilli. He calls attention to the fact that all the cases of jaundice recorded in literature as having a Widal reaction have also an infectious origin.

Agglutination of Typhoid Bacilli in Proteus and Staphylococcus Infections.—In 2 cases of an otitic proteus infection, one of which was complicated at the same time with a streptococcus and staphylococcus infection, Lubowski and Steinberg³ (Breslau) were able to find an agglutinating reaction of their blood-serum with the typhoid bacillus up to a dilution of 1 : 80. Experiments with guineapigs and rabbits demonstrated that by injecting proteus and staphylococcus cultures, the agglutinating property of blood-serum of these animals could be decidedly enhanced for typhoid bacilli. Treatment with *Streptococcus cholerae Asiatica* and *Bacillus fluorescens liquefaciens* did not produce such results.

¹ Münch. med. Woch., 1904, li, 908, No. 21. ² Münch. med. Woch., 1904, li, 469.

³ Deut. Arch. f. klin. Med., 1904, lxxix, 396.

Dysenteric Toxin.—L. Rosenthal¹ (Moscow) was able to isolate a dysenteric toxin by filtering bouillon-cultures through Chamberland filters; he claims to have been the first one to do this, and employed the same technic as is used to separate diphtheria toxin. Alkaline Martin's bouillon was found to be the best culture-medium, and a weak toxin developed within 3 days. Five cc. of a 3 days' old toxin killed a rabbit after 3 weeks; of an 11 days' old toxin in 12 hours, and if a 21 days' old toxin was used, 0.1 cc. injected subcutaneously killed a rabbit weighing 4 pounds in from 24 to 48 hours; the symptoms were diarrhea, paralysis, fall of temperature, collapse, and death. The autopsy showed peritoneal injection, intestinal hyperemia and hemorrhage, also hemorrhage from the vesical mucous membrane, and serous effusion into the peritoneal cavity. The toxin is very resistant; temperatures between 70° and 100° do not destroy but weaken it; alkalies destroy it, but acids do not affect it. Animals immunized with dysenteric bacilli are immune against the toxin; a serum can be manufactured with the toxin which protects against the infection with dysentery bacilli.

Vaccination Against Cholera.—N. Murata² (India) has been the first physician to employ Kolles' modification of Haffkine's method of protective vaccination against cholera in large numbers of patients. Kolles' modification consists in the employment of dead cultures instead of living bacteria, and his statement that dead cultures are of equal immunizing power is based upon experimental work. Murata injected the equivalent of 0.0002 gram of cholera vibrios in 1 cc. of sodium chlorid solution. Of every 10,000 vaccinated individuals, 6 contracted the disease, while of every 10,000 unvaccinated individuals, 13 contracted it. Of the former number, 42 % died, of the latter, 75 %. A distinct prophylactic value is claimed for the vaccination, as the disease in the vaccinated was always milder. After doubling the immunizing dose he noted no more cases among the vaccinated. Immunization is absolute without danger. An agar culture 24 hours old is mixed with normal salt-solution; this is heated to 60° C. for 30 minutes; mixed with 0.5 % carbolic acid solution; and 1 cc. of this injected. Occasionally slight rise in temperature, headache, malaise, and local tenderness are noted for 24 hours.

Immunity Against and Agglutination of Streptococci.—F. Neufeld³ (Berlin) succeeded in immunizing rabbits against streptococci as readily as against pneumococci. He employed the following method: He first injects a culture composed of dead bacteria, using it either subcutaneously or intravenously. The second injection, 10 days later, is made up of living, fully virulent bacilli. He increases the size of his doses very rapidly, considering it desirable to produce febrile reactions which last for several days. He employs for the experiments only the bodies of the bacteria, centrifugating them from the fluid; the poisons contained in the filtrate could not be immunized against, and animals died from them, even though they were immunized against large doses of

¹ Deut. med. Woch., 1904, xxx, 235, No. 7.

² Zent. f. Bact., 1904, xxxv, No. 5.

³ Zeit. f. Hyg. u. Infectiönsk., 1904, xlv, 161.

streptococci bodies. 1. He succeeded in producing immunity against relatively large doses of very virulent streptococci. 2. The serum of these animals contains, after a few treatments, not only immunizing, but also agglutinating, substances in considerable concentration. 3. Both varieties of the specific substances are active not only against the streptococci, with which the animal has been treated, but also against all other streptococci. 4. The agglutination of a virulent streptococcus is greater than that of virulent organisms. 5. He has not been able to prove the specificity of the streptococci isolated from scarlet-fever cases.

THE BLOOD AND DUCTLESS GLANDS.

The Clinical Significance of the Most Important Morphologic Changes in the Red Blood-corpuscles.—According to the investigations of O. Boellke,¹ the occurrence of basophile granules in the red blood-corpuscles is due to the action of toxins, some of which are as yet unknown. This has been proved positively in lead-poisoning and in decomposition of blood in the intestines, and is also probable in pernicious anemia and in autointoxication. Boellke was able, by staining, to demonstrate that the basophile granules do not arise from disintegration of the nuclei, but by degeneration of the protoplasm itself. The polychromatophilia is not caused by solution of the nuclear substance, but is likewise produced by a change in the cell-protoplasm.

The Appearance and Significance of Certain Granules in the Erythrocytes of Man.—V. C. Vaughan, Jr.,² on staining specimens of fresh blood with Unna's polychrome methylene-blue, as prepared by Gruebler, was able to find among the erythrocytes some cells which contained a variable number of granules with a decided reddish-purple tint. Such granular cells were found in but small numbers in normal blood, and were uniformly small in size and distributed homogeneously throughout the cell. They vary in normal blood from 0.5 % to 2 %; in the newborn they are present in larger number,—probably from 3 % to 7 %,—depending upon whether the child is born prematurely or at full term. The blood-picture assumes the characteristic appearance of normal adult life very quickly. In pernicious anemia the number of granule-cells was much more numerous, varying from 8 % to 19 %; the granules were large in size and were aggregated chiefly in the center of the cell. Vaughan thinks they cannot be artefacts, as they do not increase when the specimen is allowed to stand, and also because of the constancy of their number in the blood of normal individuals and those suffering from diseases not affecting the blood-picture. They cannot be due to alteration of the hemoglobin content of the cell, as they are most abundant where the hemoglobin is normal in appearance and distribution. Experimental evidence points to the probability that they are remains of a nucleus which has disappeared either through a process of karyorrhexis or karyolysis. When nucleated red cells are most frequent, as in perni-

¹ Virchow's Arch., 1904, Bd. clxxiii, Heft 1, S. 47.

² Jour. of Med. Research, 1904, x, 342.

cious anemia and in newborn children, the granulated cells are most abundant. Their importance depends chiefly upon whether they are present in a large proportion of cells or not. When they are present in a larger percentage than normal, the same value can be attached to them within certain limits as can be given to the finding of nucleated red corpuscles. An increase of these cells may, however, be seen long before the discovery of nucleated cells, and thus lead to the suspicion of an abnormal condition forming. An increase of the granular cells to 9 % or 10 % would indicate a marked departure from the normal, and would probably not occur in the absence of the nucleated forms. Concerning prognosis, in secondary anemia their presence in large numbers would be looked upon as a favorable sign, indicating a state of blood regeneration; in pernicious anemia its prognostic value would be practically *nil*. The rise of the blood-count and the hemoglobin index are more favorable signs in this disease.

A Study of the Volume Index: Observations upon the Volume of Erythrocytes in Various Disease Conditions.—The expression volume index refers to the size of the erythrocytes in comparison with the normal. J. A. Capps¹ (Chicago) found that the centrifuge accurately determines the mass of red corpuscles, but cannot be relied upon for the estimating of the number of cells, because the volume of the cell undergoes variations in disease. The volume is best obtained by using the centrifuge in conjunction with the hemocytometer. The cell volume is invariably increased in pernicious anemia—more so usually than the hemoglobin content of the cell. The heightened volume index is a more constant and trustworthy sign of pernicious anemia than the increased color index. The polychromemia in this disease is due to an increase in cell volume and not to an increased affinity of the protoplasm for hemoglobin. Moderate cases of secondary anemia show only a slight loss of volume, but if the anemia is of high grade, the cells become small and atrophic. Some secondary anemias show, during the early stages, the low color and volume indexes of a chlorosis, but later the oligocythemia becomes marked, the blood turns macrocytic, with high volume and color values, thus resembling pernicious anemia. In a large proportion of chlorotics the cell volume suffers as well as the hemoglobin, but to a less extent. The volume is of great significance in prognosis. Patients with a nearly normal volume index recover quickly; those with a low volume index respond slowly to treatment, no matter what the hemoglobin may be. Before the cell can take up its normal amount of hemoglobin it must grow to its normal size. In all anemias the color loss is greater and takes place more rapidly than the volume loss; the volume is also restored before the color reaches normal. The hemoglobin content represents the point of saturation of the protoplasm. With the color index above 1.00 we may assume an increased cell volume, except in jaundice, where the color-test is unreliable. Supersaturation of the cell-protoplasm with hemoglobin probably does not occur, but the cell may lose hemoglobin without losing in volume.

¹ Jour. of Med. Research, 1904, x, 367.

The volume seems to be chiefly altered by influences affecting cell-growth or degeneration. The large erythrocytes of pernicious anemia are probably young cells. Small cells may result from a malnutrition of the bone-marrow, as in chlorosis, or from an actual degeneration, as in sepsis. The cell volume suffers remarkably little change from osmosis. Dropsy, cyanosis, the hydremia of acute hemorrhage, and jaundice do not materially alter the volume of the cell.

The Pathologic Effects of Periodic Losses of Blood.—Having noticed that the regular and periodic abstraction of blood, after it has been carried on for two or more years, leads in some horses to serious derangement and death, T. Smith¹ (Boston) made a series of observations concerning the cause of this. He studied, in normal horses and in those repeatedly bled, the resistance of the red corpuscles to different concentrations of sodium chlorid solutions and different dilutions of blood-serum, also the osmotic tension of the red corpuscle of the normal and bled horse, and draws from these studies the following conclusions: The maximum and the minimum resistances of the red corpuscle of the normal horse are approximately 0.42 % and 0.60 % salt-solution. The resistance of the red corpuscles of most of the horses which have been repeatedly bled is so changed as to correspond to a rise in osmotic tension of 0.04 % to 0.09 % salt-solution, in the latter case to nearly one-half the total range of resistance (0.42 % to 0.60 %). 3. There is no evidence at hand to show that the injection of diphtheria toxin plays any appreciable part in this change. 4. The osmotic tension of the serum does not adapt itself to the change in the corpuscles.

The Variability of the Leukocytes.—According to the investigations of E. Neumann,² the various forms of leukocytes in the frog's blood constitute a continuous series of development from lymphocytes to polymorphonuclear cells. This statement is based on 3 facts: (1) In the circulating blood all the transitional stages between the two extremes can be demonstrated. (2) The bone-marrow adds lymphocytes almost exclusively to the blood, while in the circulating blood the polymorphonuclear leukocytes predominate. (3) In inflammatory exudates the large polymorphonuclear cells increase at the expense of the lymphocytes during the course of the migration process. This is opposed to the dualistic theory of Ehrlich, which places the lymphocytes in an entirely separate class. Neumann believes that the monistic theory can be demonstrated in man and mammals, as well as in the frog. For example, in cases of leukemia with marked increase in the lymphocytes of the blood inflammatory exudates contain only the polymorphonuclear cells. The transformation must take place during the migration from the blood-vessels to the outer surface.

The Origin of the Blood-platelets.—According to the investigations of P. Schneider³ blood-platelets are not independent cells, but cell-derivatives. Most of them arise from the red corpuscles, while some

¹ Jour. of Med. Research, 1904, xii, 385.

² Virchow's Arch., 1903, Bd. clxxiv, Heft 1, S. 41.

³ Virchow's Arch., 1903, Bd. clxxiv, Heft 2, S. 294.

may come from the white corpuscles. The greater number possess nuclear substance, which is slightly tinged by stains, and is the reason for their resistance to the soluble action of dilute acetic acid.

Action of Adrenalin on the Blood.—The production of glycosuria after injection of adrenalin has already been studied by other observers. M. Lœper and O. Crouzon¹ have studied the action of adrenalin on the blood. They find that the lipolytic and amylolytic powers of the blood are reduced, as well as the glycolytic. Adrenalin also produces a temporary diminution in the number of red corpuscles, while the white cells are markedly increased, especially the polynuclear neutrophiles, but also the mononuclears and eosinophiles. A parallel action is produced on the hematopoietic organs. The bone-marrow becomes red, and exhibits characteristics of increased activity. The spleen also becomes somewhat enlarged and congested; the proportion of phagocytes ("macrophages") increases decidedly, and the cells take up large amounts of iron pigment from destroyed red corpuscles. The authors believe that the diminution in the number of red corpuscles in the blood is due to an increased hemolytic action of the spleen. In Addison's disease an excess of red corpuscles has been found in the blood. It is evident that the suprarenal secretion exerts an influence on the organs which destroy the red corpuscles, and is necessary for the maintenance of the erythrocytic and hemoglobin equilibrium of the blood.

The Action of Lead, Mercury, Phosphorus, Iron, and Quinin on the Bone-marrow of Rabbits.—R. Stockmann and F. J. Charteris² (Glasgow) found that chronic lead-poisoning causes pronounced anemia in rabbits; that the bone-marrow shows at first a marked increase in its leukoblastic cells, with disappearance of its fat, and sometimes a very moderate amount of hyperemia, and that this is succeeded by gelatinous degeneration with atrophy of the whole marrow tissue. Minute doses of mercury do not increase the red corpuscles and hemoglobin, as noted by other observers, who probably used comparatively large doses, under which the animals rapidly became emaciated. The first effect observed is a striking increase in the number and size of the bloodvessels of the marrow, accompanied by complete atrophy of its fat-cells. Small extravasations of blood are common. Gelatinous degeneration occurs very early and is extreme. The cellular elements of the marrow disappear with it. With calomel the hyperemia is much less than with mercuric chlorid, and the degenerative changes are more gradual and less complete. With phosphorus there is hyperemia of the marrow, followed by increase of the leukoblasts and atrophy of the fat-cells, and later by gelatinous degeneration and diminution in the number of cells. A certain amount of fatty degeneration takes place in the marrow, as in other viscera, and its connective tissue becomes coarser. Hypodermatic injections of iron produce but slight reaction on the part of the marrow, and this is not specific. When iron is given by the mouth, no change occurs in the structure of the marrow and there is no evidence of increased formation of red blood-corpuscles. It promotes formation of

¹ Arch. de Méd., 1904, t. xvi, No. 1, p. 83. ² Jour. of Path. and Bact., 1904, ix, 202.

red corpuscles only by supplying the necessary hemoglobin. Quinin given subcutaneously had no effect on the histologic structure of the bone-marrow.

Significance of Megalocytes and Megaloblasts.—According to E. Bloch,¹ only the very large forms (11 to 12 μ in diameter) are to be considered of diagnostic value in progressive pernicious anemia. It makes no difference whether or not they are nucleated. Care must be taken not to regard swollen erythrocytes as megalocytes. The constant absence of macrocytes is strong evidence against the existence of progressive anemia; but isolated blood-examinations may give negative results, as the macrocytes do not enter in an uninterrupted stream into the circulation. Their numbers are not proportionate to the severity of the illness. The blood-picture should not be taken as a pathognomonic symptom in the diagnosis of pernicious anemia, but must be considered as an important support to the diagnosis made from the other symptoms.

Experimental Contribution to the Question of Cholemia.—According to A. Landau,² cholemia and its attendant symptoms cannot be regarded as an intoxication from bile. In order to solve the question he has investigated the chemic characteristics of icteric blood in rabbits. He found the total alkalinity somewhat diminished, and the amount of carbon dioxid lessened to a relatively great degree. This indicates that in cholemia acid products are formed which rob the blood of a part of its fixed alkalis, especially the carbonates. The immediate cause of death, however, cannot be attributed to this diminution in the alkalinity, nor to the presence of the acid products above mentioned. Death is due rather to the action of metabolic products that possess a still stronger toxic property.

The Fatty Content of the Blood and Various Organs in Man.—According to T. Rumpf,³ fat is found in the blood and all organs of man, even before food is absorbed from the alimentary tract (in still-births). It must, therefore, be considered as a normal constituent of the various organs. The amount in the blood varies greatly in accordance with the period of digestion. A moderate increase occurs in diabetic coma, but Rumpf did not find the extraordinarily large amounts recorded by Zaudy and by Fischer. He finds it increased more regularly in arteriosclerosis. A low percentage occurs in contracted kidney and tuberculosis. In the heart and peripheral muscles 16 parts fat in 100 parts dried substance seems to be the normal limit. Pathologically, this may rise to 59.32 parts in the heart, and 47.6 parts in the musculature. The fat-content in the liver may rise to 190 per 1000 in the fresh state and 56.6 % in the dried organ. The early stages of alcoholism and advanced tuberculosis are responsible for the greatest fatty infiltration of the liver. In atrophic cirrhosis the amount falls to normal or below. In carcinoma there is also a large amount of fat in the liver. In the later stages of diabetes the amount is near the average. The organs examined did not show, as a

¹ Ziegler's Beit., 1903, Bd. xxxiv, Heft 3, S. 331.

² Deut. Arch., Bd. lxxix, Hefte 5 u. 6, S. 551.

³ Virchow's Arch., 1903, Bd. clxxiv, Heft 1, S. 163.

rule, any material change in size; therefore an increased fatty infiltration must be accompanied by a diminution in the amount of functioning tissue. It is possible that the infiltration of fat may be partly caused by an attempt to bring abundant nutrient material to the injured tissues.

The Significance of the Blood-corpuscles in the Coagulation of Blood in Several Arthropods; and the Influence of Mechanic Forces on these Cells.—Leo Loeb¹ communicates the results of his experiments with the blood of certain species of crab and lobster. In the process of coagulation the following phenomena are observed: (a) Agglutination of the blood-corpuscles; (b) union of protoplasm that flows out of the cells with the protoplasm of completely dissolved cells, the whole forming a gelatinous mass, which later becomes fibrillar; (c) spreading out of the blood-cells; (d) coagulation of a substance resembling fibrinogen. The union of the blood-corpuscles leads to the formation of tissue-like structures, in which the fibrillar interstitial substance resembles fibrous connective tissue; while the cells that have been destroyed may assume an arrangement resembling epithelium. The coagulation of arthropod blood may be retarded or prevented by such substances as the oxalates, sodium or potassium sulfate, sodium or potassium chlorid, gelatin solutions, etc. Loeb has studied the second coagulation, namely, that of the blood-plasma, in the blood of the lobster. The phenomena of this coagulation may be explained by the presence of a coagulating ferment in the lobster, which does not exist in certain vertebrates. Potassium cyanid, urea, and peptone solutions will prevent the second coagulation, while the presence of calcium is absolutely necessary for its accomplishment. In regard to the influence of mechanic forces, Loeb says that traction or pressure on the coagulating blood changes the cell-protoplasm into a system of fibers, which cannot be distinguished from the extracellular fibrin; at the same time the cell-granules disappear. Serum free from cells undergoes a similar fibrillar change when subjected to traction or pressure. It is probable that the coagulable substance of the blood-plasma is derived from the blood-corpuscles.

The Influence of Certain Bacteria on the Coagulation of the Blood.—L. Loeb,² from a study on the influence of bacteria on the coagulation of the blood, concludes as follows: 1. In mixing bouillon cultures of bacteria in certain proportions with the diluted blood-plasma of a goose the power bacteria have of coagulating fluids containing a fibrinogen can be tested *in vitro* and approximately constant results obtained. 2. Among the organisms tested *Staphylococcus pyogenes aureus* was found to possess a strong coagulating power, causing frequently coagulation of the plasma in 4 to 6 hours. *Bacillus diphtheriæ*, *Bacillus xerosis*, *Bacillus typhosus*, *Bacillus tuberculosis*, and *Streptococcus pyogenes* were without any marked coagulating power. For the last two organisms, however, this result can at present be received only with certain restrictions. *Bacillus pyocyaneus*, *Bacillus prodigiosus*, and *Bacillus coli* have not so strong a coagulating power as *Staphylococcus pyogenes aureus*. Their coagulating power is stronger than that

¹ Virchow's Arch., Bd. clxxiii, Heft 1, S. 1. ² Jour. of Med. Research, 1904, x, 407.

of the second group. 3. The reaction of the cultures is not the cause of their coagulating power. A sterilized culture of the staphylococcus has lost all or a great part of its coagulating power. The coagulating action of bacteria is not identical with the contact action of an otherwise inert foreign body; it is probable that bacterial products contained in the liquid culture-mediums are the direct cause of the coagulating activity of certain bacteria.

Morphology of the Coagulation of Blood and Thrombosis.—L. Gutschy¹ says that thrombosis under all circumstances is a coagulation of blood within the living vessel-walls, arising from a wounded or diseased part of the wall. He finds that, immediately after injury of the vessel-wall, a delicate, gelatinous deposit of fibrin from the blood-plasma occurs, by reason of the coagulating influence of the necrotic elements in the wall of the vessel. The cellular elements of the blood take no part in this primary formation of fibrin. It occurs before the blood-cells have come in contact with the seat of injury. The gelatinous property of the primary fibrin-membrane is the cause for the adherence of the blood-cells to the vessel-wall in the formation of a white thrombus. Following this various other changes may occur, but Gutschy thinks it is definitely demonstrated that the formation of a primary fibrin-membrane from the plasma is the first event in the formation of every thrombus.

The Morphologic and Tinctorial Changes in Necrobiotic Blood-cells.—K. Bodon² has studied the changes which take place in dead and dying blood-corpuscles. His method consisted in filling capillary tubes with blood, sealing them, standing them on end for varying periods of time, and then examining the blood by means of the modern blood-stains. The findings are given in detail, and are summed up as follows: 1. The large mononuclear cells of Ehrlich and the transitional forms are the first to disintegrate. Then follow the large lymphocytes and polynuclear leukocytes, the neutrophiles being more resistant than the acidophiles. Later the small lymphocytes follow, and finally the erythrocytes. 2. The necrobiotic phenomena in the erythrocytes: (a) Morphologic: (1) Fibrillation of the corpuscle; (2) changes in the form of the concavity; (3) diminution in size; (4) diminution in thickness; (5) disintegration. (b) Tinctorial: (1) Polychromatophilia; (2) hypochromatism; (3) achromatism. 3. The necrobiotic phenomena in the leukocytes: (a) In the protoplasm: (1) Plasmolysis; (2) in granulocytes, irregular arrangement of the granules; (3) hypochromatism of the granules; (4) metachromatism of the granules; (5) total disintegration of the protoplasm. (b) In the nucleus: (1) Eccentric position; (2) change in the contour; (3) change or disappearance of the nuclear structure; (4) pyknosis; (5) perichromatism; (6) disintegration.

A Stain Applicable to Differential Leukocyte Counts in the Counting Chamber.—To be able to perform a differential leukocyte count at the same time while making a blood count B. Onuf³ (Sonyea)

¹ Ziegler's Beit., 1903, Bd. xxxiv, Heft 1, S. 26.

² Virchow's Arch., Bd. clxxiii, Heft 3, S. 485.

³ Jour. of Med. Research, 1904, xii, 87.

experimented with a large number of solutions. The mixture which seemed to fulfil all the requirements when the blood was mixed in a proportion of 1 to 200 with this staining fluid was composed as follows: (1) 12 % aqueous solution of formalin (formalin (Schering) 12 volumes; water enough to make 100 volumes); (2) 1 % aqueous solution of sodium chlorid; (3) 0.5 % aqueous solution of eosin (soluble yellowish in water); (4) Unna's polychrome methylene-blue. Equal parts of the 4 fluids are mixed and filtered; the staining solutions should not be too old. The mixture should be no older than 24 to 48 hours before using, as it readily precipitates. It takes from 15 to 30 minutes at body-temperature for the stain to reach its height. The red cells become a pale yellow; the protoplasm of the white cells, pale blue; the neutrophile granulations, dark violet; the eosinophile granules, bright red. The nuclei of the polymorphonuclear leukocytes are all purple. Onuf advises the use of a counting chamber in which the greater part of the central disk is ruled, as in the regular counting chamber the ruled space is too limited to contain a sufficiently large number of leukocytes for a differential count.

Metabolism in Chlorosis.—According to the investigations of G. Vannini,¹ a retention of nitrogen occurs in chlorosis, the mechanism of which is as yet unknown. The absorption from the intestinal tract is normal for proteids, as well as for fats and carbohydrates. The nitrogenous constituents of the urine vary considerably, especially the ammonia and urea. From 13 % to 16 % of the sulfur contained in the food is excreted in the feces; the remainder escapes through the kidneys. In chlorosis a retention or loss of sulfur may occur, depending upon a preservation or destruction of the body-proteids. The earthy phosphates are often diminished, while the phosphorus in the feces may be increased. There is a constant diminution of chlorids in the feces, while those in the urine may be increased or decreased. The ash of the feces is normal in quantity and composition. The excretion of calcium and magnesium is often increased or diminished, depending upon the destruction or formation of osseous tissue, which sometimes occurs in chlorosis. There is also at times a disturbance of the sodium and potassium balance, dependent probably on changes in the interchange of fluids between blood and tissues.

Acute Leukemia.—A. Gilbert and E. Weil² report 2 cases of acute leukemia in young subjects, characterized by the sudden onset of a severe angina with fever, inflammation, and hemorrhages of the gums, moderate enlargement of the spleen and of some lymphatic glands, hemorrhages into the skin and mucous membranes, and marked anemia. In one case the anginal symptoms were so marked as to provoke a diagnosis of diphtheria. The leukocyte count was 92,500 in one case, and only 4400 in the other. The authors believe that the pharyngeal form of acute leukemia is the most frequent. The leukocytosis may be very feeble in the acute form of leukemia, and, in fact, the number of leukocytes may be below

¹ Virchow's Arch., 1904, Bd. clxxvi, Heft 3, S. 375.

² Arch. de Méd., 1904, t. xvi, No. 2, p. 163.

normal. This is explained by the presence of an intercurrent infection, local or general, causing a marked leukolysis. In such cases the diagnosis rests on a qualitative count. Acute leukemia is characterized especially by an increase in large, nongranular, mononuclear leukocytes, with a large oval nucleus poor in chromatin.

A Case of Acute Leukemia, with a Scheme for the Classification of the Leukemias and Pseudoleukemias.—A typical case of acute leukemia is reported by F. Parkes Weber.¹ In almost all cases of acute leukemia the blood-changes have been those of a lymphatic leukemia, in which the small and large lymphocytes are principally increased. In many cases these cells arise almost exclusively from the bone-marrow. As the basis of his classification Weber regards all forms of leukemia as the result of a hyperplastic tumor-formation in the tissues that produce leukocytes, the tumor-cells passing actively or passively into the circulation. These cells may be the primitive nongranular lymphocytes or the more differentiated granular cells. Weber classifies all kinds of leukemia and pseudoleukemia under 6 fundamental types: (1) Formation of lymphocytic cells in the bone-marrow, without passage into the circulation (myelogenous pseudoleukemia, multiple myeloma of lymphatic type, etc.). (2) Similar to the foregoing, with the passage of lymphocytes into the circulation (myelogenous lymphocythemia and some cases of acute lymphatic leukemia). (3) Formation of lymphocytic cells in the lymph-glands and lymphadenoid tissue, without passage into the circulation (lymphatic or splenic lymphadenoma or pseudoleukemia, Hodgkin's disease). (4) Similar to the foregoing, with passage of lymphocytes into the circulation (lymphatic or splenic lymphocythemia). (5) Formation of cells of the myelocyte type, without passage into the circulation (myelogenous pseudoleukemia, multiple myeloma). (6) Formation of myelocytic cells, with passage into the circulation (myelogenous or spleno-myelogenous leukemia).

A Case of Acute Leukemia.—The case reported by A. Januszkiewicz² was that of a previously healthy man, whose illness began with a sore throat. This was followed by a suddenly developed weakness, with symptoms of an acute infection. The main phenomena were high temperature, enlargement of the lymphatic glands, spleen, and liver, gangrenous ulcers in the mouth, violent pains in the sternum, and a rapid rise in the number of white blood-cells to a proportion of 1 to 4.5 reds, the chief increase being in the large lymphocytes. The illness lasted 5½ weeks, and the autopsy showed the changes usually found in leukemia, namely, hyperplasia of all lymphatic tissue, lymphomas in the various organs, punctiform hemorrhages in various structures, and transformation of the bone-marrow in the ribs and sternum into a pale-greenish, pus-like mass. The blood-examination showed a predominance of large lymphocytes—69 % to 87 %; the neutrophile myelocytes at first formed 5.25 %, but gradually diminished in numbers. The remainder of the white cells were made up of multinuclear leukocytes, transition forms, small lymphocytes, mast-cells, and mononuclear leukocytes.

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 2, S. 324.

² Virchow's Arch., Bd. clxxiii, Heft 2, S. 309.

Splenic Leukemia in a 5 Weeks' Old Calf.—D. A. de Jong¹ reports a case of this kind as being interesting from a comparative pathologic standpoint.

Contribution to the Knowledge of the Cause of Hemophilia.—E. Abderhalden² reports a hemophilic family in which all the affected members suffered from hemorrhages from the mucous membranes and into the joints only. Wounds of the skin invariably healed normally, and the blood in such cases coagulated normally. The cause of the hemophilia here must have been a purely local one, most probably an anomaly in the structure of the small vessels in the mucous and synovial membranes.

Functional Mechanism of the Spleen.—K. Helly³ finds that the spleen exercises a function similar to that of the lymphatic glands in purifying the blood of animate and inanimate elements. These elements first pass through the walls of the bloodvessels in the spleen, and remain between the cells of the pulp for varying periods of time. A later phase of the process depends upon the activity of phagocytes, which may make the deposit a permanent one, or may wander further with their contents. The elements deposited in the splenic pulp from the blood are not affected by the action of the muscular tissue in the capsule and trabeculas.

Pathology of the Elastic Tissue of the Spleen.—According to B. Fischer,⁴ the elastic tissue of the spleen may undergo no change whatever in some affections of that organ, such as infarct. In acute splenic tumor, for example, it may become lacerated through enlargement of the organ, but undergoes neither increase nor decrease of its elements. The elastic tissue is destroyed in circumscribed inflammations (tuberculosis, abscess, etc.); and in some cases of splenic tumor (leukemia, amyloid degeneration), the stretching of this tissue may be followed by its disappearance. In many cases there is more or less of a new formation of elastic tissue, which usually goes hand in hand with the increase of the collagenous connective tissue of the spleen. This occurs frequently in chronic splenic tumor, but may also occur in contractions of the organ. This new formation of elastic tissue may assume 4 forms: 1. Compensatory new formation, in which the elastic tissue increases in proportion to the size of the spleen. 2. Simple hyperplasia, consisting of an overcompensation. 3. Fibroelastic induration of the spleen, found in syphilis, etc. 4. Elastic hypertrophy of the capillaries, seen frequently in leukemia.

Anatomicopathologic Study of Chronic Thyroiditis.—From a study of the thyroid bodies obtained from a large number of autopsies, P. de la Touche and M. Dide⁵ conclude that there are very few normal glands. They give a detailed description of the variations found in the glandular vesicles and their epithelium, in the contents of these vesicles, the lymphatics and bloodvessels, and the connective tissue. Their classification of the lesions, based especially on the sclerotic changes, is as follows:

¹ Virchow's Arch., Bd. clxxiii, Heft 3, S. 511.

² Ziegler's Beit., 1904, Bd. xxxv, Heft 1, S. 213.

³ Ziegler's Beit., 1903, Bd. xxxiv, Heft 3, S. 387.

⁴ Virchow's Arch., 1904, Bd. clxxv, Heft 1, S. 69.

⁵ Arch. de Méd., 1904, t. xvi, No. 2, p. 229.

1. Diffuse total sclerosis. 2. Monoalveolar sclerosis. 3. Perilobular and intralobular sclerosis—(a) With extensive vesicular lesions. (b) With more discrete vesicular lesions. (c) Without vesicular lesions.
4. Perilobular sclerosis. 5. Insular sclerosis. 6. Without sclerosis—(a) Increased colloid, with or without vesicular changes. (b) No special lesions.

Investigations Concerning the Condition of the Thyroid Gland in Smallpox.—H. Roger and M. Garnier¹ find that the characteristic feature is an increase in the colloid secretion. The gland, which is not very active in the adult, begins to secrete profusely; the vesicles empty their reserve contents into the lymph-vessels and secrete a new colloid, which does not have time to accumulate and become concentrated, but flows off through the secretory channels. The microscopic picture of the gland is completely changed; here and there the vesicular arrangement has completely disappeared, and the proliferating cells lie next to one another without special arrangement. The rapidly secreted colloid mass appears clear, pale, at times finely granular; the reactions to stains may be altered. Hemorrhages into the parenchyma may also be found.

Aplasia of the Thyroid Gland.—J. Erdheim² found an entire absence of the thyroid gland in a histologic examination of the cervical organs in 3 cases of sporadic cretinism. This indicates that sporadic cretinism does not depend on an atrophy or degeneration of the thyroid gland, but is caused by a complete congenital aplasia of the organ. Nursing at the breast does not postpone the development of the clinical symptoms in such cases, thus proving that the mother's milk contains no part of the thyroid secretion. A remarkably small thymus gland was found in all 3 cases. Erdheim also examined 5 cases presenting the rare "thymus metamera IV," *i. e.*, accessory thymus lobules developed from the fourth branchial cleft. These lobules are always connected with one or two epithelial bodies ("Epithelkörperchen"), and may be intimately commingled with them. Numerous accessory epithelial bodies may be found in addition to the 4 principal ones, which fact must be taken into consideration in extirpation experiments.

Tumors of the Thyroglossal Duct.—In 3 cases of total aplasia of the thyroid gland, in one case of unilateral aplasia, and in one other case, Erdheim found that the root of the tongue showed a multiform structure. They evidently had their origin from the thyroglossal duct and its appendages, as they contained all the different forms of tissue which are usually found in those structures. The tumors are congenital, benign, and grow with extreme slowness.

Cysts and Glandular Vesicles around and in the Branchiogenic Organs.—Erdheim finds that in cases of sporadic cretinism the lateral as well as the median lobes of the thyroid gland are aplastic. In the place of the lateral lobes there is found, with great regularity, a cyst, which is an indifferent entoderm rest from that branchial cleft which ordinarily

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 1, S. 14.

² Ziegler's Beit., 1904, Bd. lxxxv, Heft 2, S. 366.

gives rise to the lateral thyroid body. In connection with the upper epithelial bodies are sometimes found epithelial ducts and cysts, which convey the impression of rudimentary efferent ducts; they arise from the posterior branch of the fourth branchial cleft. Cysts are much more frequently found in connection with the lower epithelial bodies; they are composed of cells with light or dark protoplasm, and may be classified as rudimentary mucous glands; they arise from the posterior branch of the third branchial cleft. Cysts may also be found in connection with accessory epithelial bodies. Likewise the thymus gland and accessory thymus lobules may be accompanied by cysts rising from the epithelium of the branchial clefts. In the epithelial bodies of man after 30 years of age are found follicles containing colloid material; they have no relation to the function of the bodies, and are to be regarded merely as a reversion to the original structure of these organs.

Changes in the Nervous System after Parathyroidectomy.—It has been shown that after extirpation of the parathyroid glands in dogs the animals die of a generalized tetany. According to C. K. Russell,¹ these symptoms are probably due to certain changes, found by him in the cells of the central nervous system. These alterations consist in: (1) Chromatolysis, especially in the neighborhood of the nucleus, often associated with dislocation of the latter. (2) In severe cases a shrinkage and distortion of many of the large pyramidal cells. (3) A proliferation and accumulation of neuroglia cells around the pyramidal cells.

Cretinism in Calves.—C. G. Seligmann² (London) describes a type of congenital cretinism in a special breed of cattle, which is common in the Dexter-Kerry, and is limited almost exclusively to England. Such cretins show the characteristic gross lesions and histologic changes to a marked degree, including those first described by Edmunds in the thyroid of human cretins. The condition cannot be ascribed to inbreeding, but is constantly associated with placental disease in the parent cow; in all cases where it was possible to examine the placentas from cretin births marked and constant changes were found. No satisfactory explanation can at present be given of the occurrence of cretinism in the Dexter breed only. As for its association with a constant form of placental disease, the latter may be considered as an indirect or secondary factor in its production, by preventing the access of the maternal thyroid secretion to the fetus in which the thyroid lesion characteristic of cretinism has arisen.

The Anatomic Relation between Akromegaly and Tumor of the Hypophysis.—G. Cagnetto³ reports 2 cases of tumor of the hypophysis. The first was a polymorphous, telangiectatic sarcoma, and did not appear to arise from the anterior section of the hypophysis. The latter was compressed against the floor of the sella turcica, and was converted into a thin layer of glandular tissue. The gland contained no chromophile cells and very little colloid. This case exhibited no acromegalic changes. The second case did show the typical signs of acromegaly, while

¹ Johns Hopkins Hosp. Bull., June, 1904, p. 195.

² Jour. of Path. and Bact., 1904, ix, 311.

³ Virchow's Arch., 1904, Bd. clxxvi, Heft 1, S. 115.

the pituitary tumor revealed a hyperplastic stroma with advanced adenocarcinomatous degeneration. The stroma contained colloid masses and chromophile cells, which were likewise found in the midst of the adenocarcinomatous parts. The first case shows that even a pronounced diminution in the function of the hypophysis does not cause acromegalic changes. Cagnetto believes that acromegaly is probably due to a primary disturbance of metabolism, which stimulates a hyperplasia of the bones of the cranium and extremities and sometimes the hypophysis, as is seen in the second case. [The frequent association of hypophyseal tumor with acromegaly is certainly more than an accidental coincidence.]

Symmetric Diseases of the Lacrimal and Salivary Glands.—

Wallenfang¹ reports a case presenting this condition, which was first described as a symptom-complex by Mikulicz. The patient presented tumors of both lacrimal glands, the smaller salivary glands, and the glands of the mucous membrane at the entrance of the larynx. The cells which went to make up these tumors resembled lymphocytes, while plasma-cells and giant-cells were also observed. Mikulicz and others have maintained that these tumors represented a simple development of lymphadenoid tissue. Wallenfang, however, dissents from this view, and regards them as pseudoleukemic lymphomas. This is supported by the character of the tumor-cells, most of which resemble lymphocytes rather than the small, round cells of lymphadenoid tissue. The presence of other cell-forms—i. e., plasma and giant-cells—also is in favor of this view.

THE CIRCULATORY SYSTEM.

Origin of Arteriosclerosis.—This paper of P. Sumikawa² is based on experiments performed upon rabbits. His method was to produce inflammation in the neighborhood of arteries by the use of corrosive substances, silver nitrate, turpentine, or microorganisms of suppuration. He found that this inflammation extends to the walls of the vessels, embracing all coats. The picture is that of a proliferating inflammation, and the intima usually exhibits the most marked processes of proliferation. The changes in the adventitia and media may disappear to a greater or lesser extent, but the thickening of the intima is permanent. In later stages it may thus appear as if the intima alone had been affected. This occurs, however, only in inflammations of moderate intensity. If the process is more severe, the other coats may lose some of their specific elements, may become yielding, and may form the basis of aneurysmal formations. It is, therefore, maintained that arteriosclerosis may arise from the extension of surrounding inflammation to the arteries.

Experimental Arterial Atheroma.—A. Gilbert and G. Lion³ were able to produce an aortitis by injection of bacterial cultures and toxins into the wall of the aorta. To the naked eye the vascular wall appeared thickened, with its inner surface covered by papillary projections. The

¹ Virchow's Arch., 1904, Bd. clxxvi, Heft 1, S. 90.

² Ziegler's Beit., 1903, Bd. xxxiv, Heft 2, S. 243.

³ Arch. de Méd., 1904, t. xvi, No. 1, p. 73.

changes were most marked in the media, extending inward from that coat into the intima, and not affecting the adventitia. At the points where the greatest change occurred calcareous deposits could be demonstrated. They were embedded in a sclerotic tissue, containing elastic fibers having a remarkable tortuosity. The beginning of this process could be observed in some places, the first changes consisting of an increase in connective tissue. The calcareous infiltration seems to begin as a degeneration of the elastic fibers, which become thickened, rigid, and brittle. The lesions, thus produced artificially, resemble closely those of arterial atheroma in man.

A Case of Periarteritis Nodosa.—According to D. Veszprémi and M. Jancso,¹ this rare condition presents a varied and inconstant clinical picture. In their case, which occurred in a boy of 14 years, the chief symptoms were an urticarial eruption, which left cutaneous hemorrhages behind it, followed, after an interval of 4 months, by a meningeal hemorrhage, causing convulsions, paralyses, and choreiform movements, accompanied by albuminuria. At autopsy multiple miliary aneurysms, thrombi, and hemorrhages were found in various parts of the body. The whole seemed to depend upon a diseased condition of the blood-vessels. The adventitia of the smaller arteries was found to be infiltrated with large numbers of leukocytes, which also extended into the outer part of the media. The resistance to blood-pressure was thus weakened, and dilation of the vascular walls occurred in many places. The media became stretched, and with it the elastica, the fibers of which became torn. In the course of time the infiltration diminished in intensity, and young connective-tissue cells began to proliferate, extending at length even into the intima. Here and there could be seen hyaline-like rings, resulting from a coagulation-necrosis of the thickened intima and atrophied media. The authors believe the cause to be of an infectious nature, but not syphilitic, as the histologic picture does not correspond with that of syphilitic arteritis, and there was an entirely negative history concerning lues.

Another case belonging to the group of periarteritis nodosa is reported by E. Ferrari.² The smaller arteries of the heart, liver, kidneys, suprarenal bodies, and diaphragm showed extensive changes. The primary changes consisted of a hyaline degeneration of the smooth muscle-fibers in the media. This is contrary to previous opinions, which place the primary changes either in the adventitia or in the intima. The degeneration of the media succeeded a paralysis of the muscle-fibers, as was evidenced by the pronounced stretching of the vascular walls. A striking feature was the occurrence of numerous clear spaces between the muscle-fibers, due to an edematous saturation of the media. In later stages the edema extended also to the adventitia and intima; still later an enormous cell-proliferation occurred in the adventitia, and a hyaline degeneration in the intima. A proof of the supposition that the first changes occur in the media is found in the clinical symptoms, which are best referred to a pri-

¹ Ziegler's Beit., 1903, Bd. xxxiv, Heft 1, S. 1.

² Ziegler's Beit., 1903, Bd. xxxiv, Heft 3, S. 350.

many paralysis and degeneration of the muscle-fibers in the blood-vessels. Ferrari believes that the disease can best be explained by the action of some noxious agent on the vasomotor centers. In many cases alcohol seems to be this agent; in others, it may be the toxins of acute infectious diseases or the products of an autointoxication. In addition to the vascular changes, degenerative changes are frequently found in the muscular tissue and nerve-fibers. These degenerations are probably due to the weakening of the vascular walls and consequent lowered blood-pressure. In the muscular tissue they consist of loss of striation, fine longitudinal splitting, and granular and hyaline degeneration. The affected nerves lose their medullary sheath. The arterial disease is the basis of all these changes. As the degeneration of the arteries begins in the media, Ferrari advocates discarding the term "periarteritis nodosa" for "polyarteritis acuta nodosa."

Normal Histology and Sclerosis of the Aortic Valve.—According to J. G. Mönckeberg,¹ the leaflets of the aortic valve are composed of 3 principal layers: one, directed toward the ventricle, consisting chiefly of elastic tissue; a middle layer of loose connective tissue; and a third, directed toward the lumen of the aorta, composed of bundles of connective tissue running transversely. The first layer corresponds to the subendocardial tissue of the heart, and merges directly with the latter; however, it contains no muscle-fibers, but is reinforced by longitudinal bundles of connective tissue. The second layer ends at the insertion of the valve. The third layer is the chief component of the valve; it arises from the connective tissue of the middle aortic coat; it contains no elastic tissue. In sclerosis of the aortic valve the first pathologic changes take place at the insertion of the leaflets. The third or internal layer only is affected at this stage, consisting in an increase in the thickness of the layer, with retrogressive metamorphoses. The latter are made up of fatty degeneration, focal disintegration of the nuclei, exudation between the necrotic connective-tissue fibers, and deposits of calcium salts. As the disease progresses the layer becomes thicker, the necrotic foci become larger and confluent, the firm connective tissue becomes loosened, and there is an increase in the fatty change. At the same time there may be a slow increase in the cellular elements of the connective tissue. By this time the process has extended to the periphery of the leaflets. The calcareous deposits become larger and form compact masses. Finally, the function of the valve is disturbed, and at this stage the leaflets are stiff, from universal calcification, are more or less fused with each other, and are shrunken in their longitudinal axis. Calcareous excrescences are found projecting into the sinus of Valsalva and into the lumen of the aorta. Microscopically, the disease is always seen to be confined to the internal layer, even in the most advanced cases. In very old cases foci of cartilaginous and osseous tissue may be found. This primary sclerosis of the aortic valve is to be carefully distinguished from an extension of aortic atheroma to the v latter condition the process begins usually at the free and is confined to the external layer instead of

⁴ Virchow's

Left 3, S. 472.

The Elastic Tissue in the Ventricle of the Heart under Normal and Pathologic Conditions.—J. F. Poscharissky¹ examined the hearts from 28 different species of reptiles, birds, and mammalia. In the reptiles and birds he found elastic tissue in small quantities only in the vicinity of bloodvessels; it was altogether wanting between the muscle-fibers. The same was true of small mammalia; but in the larger animals of this order elastic tissue was found at times apart from the immediate neighborhood of the vessels. In man Poscharissky found elastic fibers between the muscle-cells in all cases examined. The fibers arise from 3 sources—the pericardium, the endocardium, and the adventitia of the bloodvessels. The elastic tissue is found under normal conditions, as well as in diseased states of the heart-muscle. With advancing age the fibers increase in quantity. In various chronic myocardial affections the elastic tissue undergoes a marked hyperplasia, especially in the adventitia of the bloodvessels and in the outer layers of the endocardium; the intermuscular elastica takes little part in this increase.

Two Rare Anomalies of the Chordæ Tendineæ in the Human Heart.—The first case reported by J. F. Poscharissky² was characterized by 4 tendinous threads traversing the left ventricle. Microscopically they consisted of hyaline-degenerated connective tissue with elastic fibers. In the second case a fibrous band was stretched across the lumen of the pulmonary artery at the semilunar valves. Poscharissky believes that this band represented a part of one of the semilunar valves, which had become separated in advanced life.

The Fibroses of the Heart.—Fibrosis of the heart, according to J. M. Cowan³ (Glasgow), may be the result of several causes. In the great majority of cases, and in all those in which large fibrous patches obtain, the condition is the result of degeneration of the muscle-cells and secondary fibrosis (infarct and paraarterial fibrosis). The muscular degeneration is the result of interference of its blood-supply through the coronary arteries. In other cases a fibrous overgrowth occurs in the vicinity of the arteries, as the result of various causes, and a primary connective-tissue reaction occurs. These periarterial fibroses are never so extensive as the paraarterial varieties, and the two are often associated. Fibrous patches may be found in the heart, the result of inflammation of the endocardium, but the lesions are always local. Pericarditis has little or no influence on the connective tissue of the myocardium, except in its immediate vicinity, and even then, as a rule, only to a slight degree. Gummas or trauma may leave scars. Hypertrophied hearts are not necessarily fibroid, but frequently are so from the arterial disease with which they are so often associated. Chronic valvular endocarditis seems always to be accompanied by an increase in the connective tissue of the myocardium. Aneurysm of the heart may result from any lesion which lessens the resistance of the myocardium to the intracardiac pressure. Such lesions may be due to acute processes (inflammation myomalacia), but are in the large bulk of

¹ Ziegler's Beit., 1904, Bd. xxxv, Heft 3, S. 510.

² Ziegler's Beit., 1904, Bd. xxxv, Heft 3, S. 521.

³ Jour. of Path. and Bact., 1904, ix, 209.

cases the sequel of fibrosis of the myocardium. It is extremely improbable that pericardial adhesions can produce aneurysm.

Massage of the Heart.—C. Schwarz¹ has tried the effect of massage on the hearts of animals after death from chloroform, suffocation, and various cardiac poisons. He found it to be a valuable means of resuscitation in many cases if instituted at a sufficiently early stage. Only those cases succeed in which the death has not been due to material changes in the heart-muscles or its controlling nerves.

THE GENITOURINARY SYSTEM.

Anatomic Investigations Concerning Beginning Prostatic Hypertrophy.—In order to throw some light on the cause of prostatic hypertrophy A. Rothschild² examined microscopically the prostate glands taken from subjects between 30 and 50 years of age. He was thus enabled to study the organ in the stage immediately preceding the clinical development of hypertrophy. He examined 30 prostates, and found changes in 27 of them. These changes affected the glandular epithelium and the interstitial connective tissue. Groups of follicles were found with widened lumens, the contents of which consisted of desquamated epithelium in all stages of degeneration, coarse and fine granular detritus, and here and there masses of a homogeneous substance occasionally arranged in concentric layers. Leukocytes were found in many follicles. The characteristic change in the interstitial connective tissue was a round-cell infiltration in the region of the altered follicles. The round-cells were distributed diffusely in some parts, and collected into foci in others; the foci were frequently subepithelial, and at other times periglandular. No significant changes could be found in the walls of the bloodvessels. Corpora amylacea were found in normal numbers. The pathologic changes here described partake of a chronic inflammatory character, and correspond closely with those found in fully developed hypertrophy of the organ.

Malakoplakia of the Bladder.—Von Hanseemann³ has studied 2 cases, presenting a peculiar pathologic condition in the bladder. From the mucous membrane of that organ there projected a number of round, flat, yellowish growths, some of which were eroded at the summit. Microscopic examination revealed large nucleated cells, together with peculiar, refractive, colorless bodies, about the size of red corpuscles. The latter gave the reaction for iron. The accumulation of cells was found deep in the submucosa, and showed no connection with the epithelium of the mucous membrane. The cells were loosely embedded in a scanty ground-substance of fine connective tissue and capillaries. Some of them contained one nucleus, and some had two or more. At times clumps of bacteria were found between the cells, but no etiologic relation could be traced between them and the growths. The peculiar refractive bodies

¹ Ziegler's Beit., 1903, Bd. xxxiv, Heft 3, S. 532.

² Virchow's Arch., Bd. clxxiii, Heft 1, S. 113.

³ Virchow's Arch., Bd. clxxiii, Heft 2, S. 302.

were mostly in the cells, but also between them. Von Hanseemann emphasizes the point that they are not to be regarded as parasites. The nature of these growths is entirely unknown. He has coined the word "malakoplakia" to describe them, the term having reference to their plaque-like appearance and to their softness.

Disturbances in the Development of the Kidneys.—E. Meyer¹ attempts to show a connection between disturbances of development in the kidneys and the subsequent formation of cystic and other tumors in those organs. He reports a case of a child having several malformations, together with embryonal changes in the kidneys. The Malpighian bodies and glomeruli of these organs were well developed, as were also the straight tubules; but the connecting link between these—namely, the convoluted tubules—was wanting. Their place was taken by a ground-substance, uniform with that of the remainder of the kidney, embedded in which were cells that resembled those of the convoluted tubules in size, form, and, to a certain extent, distribution. Meyer believes that this case tends to prove the theory that the kidney develops from two separate embryologic foundations, which unite by means of the convoluted tubules, these structures being the last to develop. In the case cited proper union did not occur, by reason of some inhibiting influence. It is possible to conceive that those parts of the organ which lacked the proper developmental tendencies in embryonal life might later become subject to irregular proliferating forces, and thus give rise to tumor-formations. In support of this view Meyer reports a second case—that of cystic degeneration of the kidney in a child. In this kidney was found a system of canals with isolated glomeruli, and a second system arising from the ureter, without any connection between the two. The cystic formation was probably due to a developmental and secretory energy, exercised in abnormal directions. The tendency of cystic kidneys to occur in different members of the same family is brought in to support this theory, 2 cases, occurring in brothers, being cited.

Changes in the Kidneys of Rabbits after Lesions of the Papillas.—In order to study the changes which occur in the kidneys after obstruction of the urinary tubules, A. Pettersson² carried out a series of experiments on rabbits. With all operative precautions a piece of silk thread was introduced into the urinary papilla of one kidney. A chronic inflammation was thus set up which closed the outlet of the urinary tubules. The result was a dilation of the affected secretory passages. The straight tubules were the first to be affected, the collecting tubules suffered the most, while the tubules of the cortex were very little affected. As a result of the changes in the papilla there was also an increase of connective-tissue formation, more marked in the cortex than in the medulla. The changes in the kidney are practically the same as those found in hydronephrosis or after ligation of a ureter. The dilation of the tubules, however, never goes so far as to produce true cysts. From these experiments, therefore, it seems very improbable that the origin of cystic kid-

¹ Virchow's Arch., Bd. clxxiii, Heft 2, S. 209.

² Ziegler's Beit., 1903, Bd. xxxiii, Heft 3, S. 605.

neys in the adult can be attributed to obliteration of the tubules in the papillas. It is different, however, for the cystic kidneys arising in embryonal life or during the stage of development of the organs. There are cases reported in literature which seem to point to a fetal obliterating papillitis as the cause of this condition.

Action Exercised in Vitro by Solutions of Sodium Chlorid on Renal Epithelium.—J. Castaigne and F. Rathery¹ find that all solutions of sodium chlorid except that which freezes at -0.78° C. alter *in vitro* the epithelium of the convoluted tubules. This alteration is due to an injurious osmotic action and not to a toxic influence. This explains why most aqueous solutions of salts are poor fixing agents; their molecular concentration is too high, and they injure the cells by osmosis before they fix them. The solution of sodium chlorid which freezes at -0.78° C. is a preservative of renal tissue, and it is advantageous to pass the fragments of renal tissue through a bath of this solution before placing them in the fixing solution.

Injurious Action Exercised in Vitro on Renal Epithelium by Normal and Pathologic Serums.—This paper by J. Castaigne and F. Rathery² contains a continuation of the experiments cited above. They find that, in order to study the true toxicity of various serums, it is necessary to bring their freezing-point to -0.78° C. in order to avoid injurious osmotic activity. This may be done by adding a few drops of a saturated saline solution. These precautions having been taken, the authors demonstrated that the normal serums of the guineapig, rabbit, and man were not injurious *in vitro* to the kidneys of the guineapig and rabbit. They believe that the renal lesions and albuminuria, produced by certain investigators by the intravenous injection of blood-serum from the same or different animals, are due to mechanic changes in osmosis, and not to a toxic action of the serum. The same results can be obtained by certain salt-solutions which are not toxic for the kidney. On the other hand, nephrolytic serum, produced by the subcutaneous injection into animals of a renal emulsion, are shown to exert their harmful influences by reason of the presence of specific toxins. In the same way the blood-serum of persons suffering from uremia, nephritis, or scarlatina is shown to contain poisons which are injurious to renal tissue.

The Action of Diphtheria Toxin, Mercuric Chlorid, and Cantharidin Upon Kidney and Spleen.—In undertaking this research it was the intention of G. Lyon³ (Edinburgh) to study the early inflammatory changes in the different tissues of the kidney, and to ascertain the correlation between the vascular and other lesions. Diphtheria toxin, mercuric chlorid, and cantharidin were employed. An attempt was made to follow the development of chronic changes, but without success; in no case did subacute or chronic nephritis develop from the acute disease in any of the animals, but the kidney was always restored to its normal integrity after the subsidence of the acute inflammation. He

¹ Arch. de Méd., 1903, t. xv, No. 5, p. 669.

² Arch. de Méd., 1903, t. xv, No. 5, p. 678.

³ Jour. of Path. and Bact., 1904, ix, 400.

concludes from this that if the noxious agent producing acute nephritis ceases to operate, the acute changes disappear entirely, and to produce a subacute or chronic type of nephritis the toxic substance must act insidiously and constantly. Diphtheria toxin was the only one of the poisons employed that produced distinct vascular lesions, and they were localized to the small arterioles of the cortex and the glomerular capillaries; the lesions were of the type of hyaline thrombi. Corrosive sublimate and cantharidin produced only intense congestion of the bloodvessels; hemorrhages in the interstitial tissue or the tubules of the cortex were entirely wanting, while found occasionally when diphtheria toxin was employed. Hemorrhage in the collecting tubules of the medulla was quite common, especially in cantharidin poisoning. Hyaline changes in the glomerular capillaries and small arterioles were almost constantly present in subacute diphtheria intoxication, but were absent in the other poisonings. The glomeruli enjoy great immunity, especially in mercuric chlorid and cantharidin poisoning, the secreting cells being much more affected than the glomeruli. In diphtheria intoxication there is an accumulation of leukocytes in the vessels. These are numerous in the tufts, and the majority show degenerative changes in their nuclei. Active proliferation of Bowman's capsular endothelium was not observed in any of the acute or subacute cases. The lesions of the secreting tubules were the prominent feature, and they must be regarded as due to the direct action of the circulating poison upon them. They are always most intense in the acute cases and in diphtheria intoxication. Although the influence of the vascular lesions cannot be entirely ignored, these play an unimportant and subsidiary part in the production of the cell-lesions. These lesions in the secreting cells of the tubules prove beyond a doubt that the poisons are excreted by them. The cells of the ascending limb of Henle are the least resisting, as proved by the fact that in rapid intoxications they will show diffuse necrotic changes, whereas the convoluted tubules of the cortex suffer to a much less extent. The coagulation form of necrosis localized to the ascending limbs of Henle in the medullary rays is seen especially well in corrosive sublimate poisoning; one of its chief characteristics is the rapid disappearance of the nuclei. The other type of necrosis is disintegrative in nature, and affects especially the convoluted tubules; this is seen oftenest in diphtheria and cantharidin poisoning. In this type of necrosis the protoplasm of the cell is more sensitive to injurious agents than the nucleus; the nucleus may be destroyed by solution of its chromatin or by fragmentation. Regeneration of the cells of the collecting and secreting tubules is found in all except the most acute cases. The cells of the collecting tubules were found to possess phagocytic properties, as they contained necrotic cells and pigment derived from red corpuscles. A small part of the casts, according to Lyon, are formed by the coagulation of an intratubular transudate; the great majority in the subacute cases arise by granular disintegration or colloid transformation of secreting cells. New-formation of fibrous tissue in the kidney has been almost entirely wanting. Destruction of red blood-cells by

phagocytes in the splenic pulp-spaces has been a constant feature in all cases. In diphtheria intoxication the polynuclear leukocytes are also damaged by the circulating poison, and many degenerative forms are found in the bloodvessels of the various organs. They accumulate in the splenic pulp-spaces, and their ultimate destruction is effected by phagocytes. This is less marked in the other two poisons. The cells which act as phagocytes in the pulp-spaces are mononucleated leukocytes and the endothelial cells of the lining of the spaces.

Cystic Kidney and Other Disturbances in the Development of the Kidney.—O. Busse¹ reports 6 cases of congenital cystic kidney. An important feature, to which little attention has been paid by previous authors, is the marked development of connective tissue in these kidneys, while the tubules and glomeruli are much diminished in number. In some places the tissue assumes the character of smooth muscle-fibers, especially in the neighborhood of the renal pelvis. The cysts of the cortex are evidently developed from the embryonal glomeruli or their capsules, while those in the medulla are outgrowths of the urinary tubules. Busse believes that cystic kidneys can be explained only by an arrest of development in embryonal life. This is supported by the resemblance which these organs bear to the embryonal kidney in their abundant development of connective tissue, in the occurrence of muscular tissue, and in the epithelium lining the cortical cysts and embryonal glomeruli. Busse's theory is that the development of the kidneys has been arrested at a certain period of prenatal life, resulting in the perpetuation of the embryonal structure of the organ. This arrest of development does not always, however, result in the formation of cystic kidneys, as is evidenced by the occurrence of simple hypoplasia of the organs. Cystic degeneration in the kidneys of adults, as well as in those of the newborn, may likewise be due to disturbances of development, the disturbances in this case being of a lesser degree. Cystic degeneration in the adult may also arise from other causes. Busse further maintains that the so-called fibromas, myomas, and myofibromas of the kidney are also to be referred to embryonal malformation, in which case the fibrous and muscular tissue normally present in the embryonal kidney undergoes a hyperplastic process. These tumors are not due to embryonal displacement of tissue, as is held by some authors.

Cystic Kidney, with Special Reference to its Heredity.—Whatever the cause of cystic degeneration of the kidneys may be, its hereditary tendency cannot be questioned. R. Dunger² reports 2 cases of cystic kidney occurring in mother and daughter, the organs from both cases showing intimate correspondence in their structure. The cases of cystic degeneration occurring in the same family may be divided into 2 groups—those which occur in different members of the same generation, and those which occur in different generations. Dunger reviews the reported cases of both groups, and finds that cystic kidneys are found at all ages, even though their origin may be congenital. The earlier classification

¹ Virchow's Arch., 1904, Bd. clxxv, Heft 3, S. 442.

² Ziegler's Beit., 1904, Bd. xxxv, Heft 3, S. 445.

into cystic kidneys of the newborn and those of adults is, therefore, untenable. Furthermore, the hereditary character of the disease is an evidence in favor of the malformation theory of its origin. An interesting point is that in all cases where an inheritance of the condition has been observed the same sex has been affected in both generations. Histologic examination of the organs in Dunger's cases showed that there had been a marked disturbance of development; there was a more or less complete absence of the convoluted tubules and Henle's tubes. This is an additional proof in favor of the malformation theory, in view of the growing evidence of the development of the kidney in two parts, which fuse later. An arrest of development in the later stages will prevent this fusion by holding in abeyance the formation of the connecting links between the two sections of the urinary tubules.

A Case of Papillary Carcinoma of the Renal Pelvis.—R. de Josselin de Jong¹ reports a case characterized by hematuria, pains in the region of the right kidney, and the presence of a tumor in that region. The kidney was removed by operation, and examination revealed a tumor growing from the pelvis of the organ into the renal tissue. Microscopic examination showed a finely branched, tree-like, connective-tissue stroma, around which were gathered masses of epithelial cells. The structure of the tumor resembled a benign papilloma, but its malignant character was manifested by irregularity in the arrangement of the cells and in the development of the connective tissue, and by aberrance in the form of the epithelial cells from those of the normal pelvis. At one point the transition from normal epithelium into the cells of the tumor could be demonstrated, thus proving the origin of the growth from the pelvis.

Action of Diuretic Substances on the Excretion of Bacteria Through the Kidneys.—Previous experiments in this direction have had varying results. G. Cagnetto and F. Tessaro,² in their investigations, employed filtered and washed bouillon cultures of *Bacillus coli* and the tetanus bacillus. The organisms were suspended in a normal salt-solution and introduced directly into the circulation of the animal. After a definite period of time the urine was withdrawn from the bladder through an abdominal opening. With this method the authors were never able to demonstrate the passage of bacteria through the normal kidney. The use of diuretics and the production of increased function by extirpation of one kidney did not alter this result in the least. They did find, however, that the subcutaneous injection of diuretin rapidly cleared the circulating blood from the injected organisms. This phenomenon does not seem to depend on an increased bactericidal power of the blood, but rather on a more rapid deposit of the bacteria in the various organs.

The Influence of Various Fats on the Formation and Excretion of Acetone.—E. P. Joslyn³ (Boston), in a series of experiments to determine the action of various fats on the formation and excretion of β -oxybutyric acid and its derivatives (diacetic acid and acetone), found:

¹ Ziegler's Beitr., 1904, Bd. xxxv, Heft 1, S. 205.

² Ziegler's Beitr., 1904, Bd. xxxv, Heft 3, S. 536.

³ Jour. of Med. Research, 1904, xii, 433.

1. That conclusions as to the relative action of the various fats, administered as neutral fats, fatty acids, or soaps, upon the elimination of acetone are of little value without proof of their absorption. 2. Neutral fats, whether of the higher or lower fatty acids, do not increase the elimination of acetone in a healthy individual during starvation for 2 days. The glycerin which such fats contain suffices to prevent the acetonuria. 3. Oleic acid produces a marked acetonuria amounting to 34 % and 97 % above the control experiments in the healthy starving subject, while the same quantity of butyric acid is without effect. The poor absorption of palmitic and stearic acids suffices to explain the negative results obtained in this and other experiments. 4. Sodium palmitate produces a marked acetonuria in the healthy starving subject. This cannot be explained by the presence of the alkali. 5. Butyric acid does not increase the acetonuria in the healthy fasting individual.

Excretion of Sugar after Injections of Adrenalin and the Influence of Artificially Produced Fever.—According to E. Aronsohn,¹ excretion of sugar is never produced by heat-puncture. Adrenalin causes its excretion only after subcutaneous or intravenous injection. The mellituria thus produced disappears under the influence of an intercurrent fever. If, however, the mellituria is accompanied by some other severe organic disease, fever may cease to have its inhibiting influence.

THE DIGESTIVE SYSTEM.

Concerning Islands of Gastric Mucous Membrane and Glands Resembling the Inferior Esophageal Cardiac Glands in the Upper Portion of the Esophagus.—H. Schridde² found such islands in 70 % of cases investigated. They are always situated in the first portion of the esophagus. Three different forms can be distinguished: The first form is identical with the esophageal cardiac glands, found normally in the lower portion of the esophagus. It consists of a racemose tubular gland, lined with cylindric epithelium, the efferent duct breaking through the squamous epithelium of the esophagus to reach the surface. The second variety of island resembles in all respects the cardiac glandular region of the stomach. The third variety was found once associated with the second, and once with both of the preceding forms; its histology is identical with that of the stomach in the cardiac region and fundus. Schridde explains the occurrence of these islands of gastric mucous membrane by the theory that the lining of the esophagus is originally of entodermal origin, and that the final squamous epithelial lining is formed by the ectoderm growing in and displacing the entoderm. Where this displacement is not complete, little islands of entoderm are left, which later develop into mucous membrane resembling that of the purely entodermal stomach.

A. Rückert³ observed these glandular structures at autopsy in 4

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 2, S. 383.

² Virchow's Arch., 1904, Bd. clxxv, Heft 1, S. 1.

³ Virchow's Arch., 1904, Bd. clxxv, Heft 1, S. 16.

adults, the appearance to the naked eye being that of an erosion. In order to determine whether or not these superior glands were normal, like the inferior cardiac glands of the esophagus, Rückert examined systematically this organ in 12 newborn infants. He found the structures present only in 50 %, and therefore answers the question in the negative, *i. e.*, that they are not normal components of the esophagus. He believes that they are due to disturbances of development in fetal life. They start as rests of cylindric epithelium in the fetus prior to the twenty-second week, become microscopically visible glandular erosions in the newborn, and develop into visible erosions with prominent secretory ducts in later life. They frequently constitute the seats of cystic formations, this having occurred in 3 out of the 4 adult cases observed by Rückert.

The Elastic Tissue in the Liver in Infectious Diseases.—T. Mironescu¹ finds that in tuberculosis of the liver the elastic fibers are destroyed if there is an exudative process going on; if there is no exudate, and merely productive processes are at work, the elastic fibers are not affected. In syphilis of the liver new elastic fibers are formed. In erysipelas they may be destroyed, but no special changes are noticed in other infectious diseases.

The Natural Disposition of the Esophagus to the Formation of Diverticulums.—A. Brosch² maintains that the natural disposition of the esophagus to the formation of diverticulums lies in the presence of gaps in the muscular wall, through which the bloodvessels and nerves pass. These gaps may be filled with connective tissue or with fat. The diverticulum is produced by an increased pulsive force, or by the contraction of inflammatory adhesions to surrounding lymph-glands. The inflammatory processes extend from the glands to the esophagus along the perivascular and perineural connective tissue.

Anatomy and Pathogenesis of Diverticulums in the Anterior Wall of the Esophagus.—A. Brosch³ details the pathologic anatomy of 22 diverticulums of the esophagus. Regarding their pathogenesis he says that the formation of an anterior diverticulum depends not only upon a natural disposition, but also upon some other factor. This factor may be either an increase in the pulsion force or an inflammation in the parts surrounding the seat of diverticulum. The pulsive force may be increased either by overtaxing the function of the esophagus or by obstruction of its lumen. The physiologic stenoses especially have a greater significance when considered in connection with overtaxed function. When inflammation plays a part in the causation of diverticulums, the process usually arises from the lymph-glands. The causes of this lymphadenitis are tuberculosis, anthracosis, and chalicosis. The inflammatory process extends from the glands to the wall of the esophagus, along the perivascular and perineural lymph-channels. An obliterating arteritis results, with shrinkage of the inflammatory tissue, thus produc-

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 2, S. 406.

² Virchow's Arch., 1904, Bd. clxxvi, Heft 3, S. 457.

³ Virchow's Arch., 1904, Bd. clxxvi, Heft 2, S. 328.

ing traction on the esophageal wall. Brosch also gives a classification of anterior-wall diverticulums.

A Contribution to the Study of Esophageal Diverticulums.—G. Riebold¹ contributes a detailed study of 46 cases of esophageal diverticulums. They are divided into 3 classes—traction, traction-pulsion, and pulsion diverticulums. The traction diverticulums are by far the most numerous, and occur almost exclusively in adults. They are situated usually on the anterior or lateral wall of the esophagus, and are single in most cases. Their form is usually that of a funnel, 3 to 6 mm. deep, the axis of which is directed obliquely upward. The walls of the diverticulum may embrace all layers of the esophageal wall, but generally the muscular layer is defective. The clinical significance of this form of diverticulum lies in the possibility of perforation, with infection of the surrounding tissues; carcinoma or tuberculosis may develop on the site of the diverticulum. Traction diverticulums are in most cases caused by chronic inflammatory processes in the bronchial lymphatic glands, the inflammation extending to the wall of the esophagus; connective tissue is formed, which later contracts and exerts traction on the esophagus. Another possible origin lies in tuberculous or purulent softening of the lymphatic glands, rupture of the abscess into the esophagus, and subsequent contraction of the abscess-wall. Riebold believes that Ribbert's theory of embryonal origin of these diverticulums holds good only in a very few cases. The traction-pulsion diverticulums probably start as pure traction diverticulums, and therefore have the same etiology and pathogenesis. The pharyngoesophageal pulsion diverticulums are produced by the effect of high pressure (passing of food, forced expiratory efforts) on a weakened posterior pharyngeal wall. The purely esophageal pulsion diverticulums consist of hemispheric sacs, composed principally of mucous membrane, and situated usually on the anterior wall of the esophagus. They occur frequently at the points of physiologic narrowing of the esophagus, and are probably dependent upon a weakness in the muscular wall at those points. The exciting cause in some cases may be the pressure of some sharp-angled foreign body, while in other cases the pressure of ordinary food may produce it.

A Case of Chronic Gastric Ulcer with Fatal Hemorrhage from the Eroded Left Renal Vein.—H. Merkel² reports a unique case of gastric ulcer of several years' duration, which finally ended fatally by reason of sudden severe hemorrhages. At autopsy an ulcer, 12 cm. long and 6 cm. wide, was found on the posterior wall of the stomach. The floor of the ulcer was fused with the pancreas, transverse colon, jejunum, and spleen, part of the last having been eroded. Near the pylorus a perforation was found, leading into the left renal vein, from which the fatal hemorrhages had occurred.

Adenomyoma of the Pylorus.—E. Magnus-Alsleben³ describes the macroscopic and microscopic appearances in 5 adenomyomas of the

¹ Virchow's Arch., Bd. clxxiii, Heft 2, S. 395.

² Virchow's Arch., Bd. clxxiii, Heft 1, S. 204.

³ Virchow's Arch., Bd. clxxiii, Heft 1, S. 137.

pylorus. In each case the tumor formed a small nodule projecting from a slightly thickened pylorus. On section the appearance to the naked eye was that of numerous delicate white lines on a grayish background. Under the microscope the grayish part was seen to be composed of muscular tissue, while the white lines represented glandular structures. The latter was made up of alveolar glands with their excretory ducts, which were directly connected with, and evidently derived from, Brunner's glands in the gastric mucosa. The muscular tissue evidently exerted an inhibitory influence on the penetrating glands, for in parts of some of the tumors atrophic, or rather "aplastic," alveoli and ducts were found. In one tumor the whole mucosa had apparently sunk into the growth, and from this the glandular tissue had developed. In no place could anything atypic be found, and there was no doubt as to the benign nature of the tumors.

Three Unusual Tumors in and around the Stomach.—F. Miodowski¹ describes 3 interesting tumors. The first was a pediculated myoma of the stomach, which caused the death of the patient by a hemorrhage into the stomach. The origin of the hemorrhage was a small ulcerated surface of the gastric mucosa, situated at the point where the pedicle of the tumor arose. The patient had had an operation for myoma of the uterus about one year before her death. The second tumor was a carcinoma of the stomach, which had given rise to metastases throughout the course of the small and large intestines. Miodowski believes that metastasis occurred first to the mesenteric glands, and thence in a radiating manner to all parts of the intestinal tract. The third tumor was a large round-cell sarcoma, which had its origin in the subserous peritoneal tissue covering the posterior wall of the stomach. It had completely filled the omental bursa, and had involved the wall of the stomach in its growth. Its size was about that of a man's head. The whole pancreas had been caught in the tumor-mass, but was found to be intact and not involved by sarcomatous infiltration.

Investigations of the Chronically Congested Liver (Red Atrophy).—C. Hart² examined histologically the liver in a condition of red atrophy in 35 cases of heart-disease. He found that the venous capillaries were the seat of peculiar coagulative processes; the central veins and branches of the portal vein were not involved. The thrombi consisted almost exclusively of fibrin, with very few cellular elements inclosed in them. The coagulation seems to be caused, however, by degeneration of the hepatic cells, as the thrombi are found wherever such degeneration has occurred. The extent and number of the clots are proportionate to the extent of cellular degeneration. This fact is a further argument in favor of Alex. Schmidt's theory concerning the connection between fibrin coagulation and cellular degeneration.

Normal and Pathologic Histology of the Biliary Capillaries, Together with a Study of the Pathogenesis of Icterus.—The investigations of S. Abramow and A. Samoilowicz³ on normal and pathologic

¹ Virchow's Arch., Bd. clxxiii, Heft 1, S. 156.

² Ziegler's Beit., 1904, Bd. xxxv, Heft 2, S. 303.

³ Virchow's Arch., 1904, Bd. clxxvi, Heft 2, S. 199.

livers show that the trabecular biliary capillaries, running in the axis of the hepatic acini, form a wide-meshed network with ampullas at the points of anastomosis. These capillaries give off intercellular branches, which usually end blindly; they do not reach the vascular boundary of the acinus, but form a small-meshed network around the nodes of the wide-meshed network. Intracellular branches are also given off, which end blindly in the hepatic cells, usually not extending as far as the nucleus. A mutual contact of the biliary and blood capillaries does not occur in the normal liver. In mechanic icterus a stagnation of bile occurs in the liver, beginning in the large biliary passages and extending into the finest branches. As a result of this the intercellular and intracellular branches lengthen, the blind ends of the former rupture, and the bile escape into the perivascular spaces. Icterus in carcinoma and atrophic cirrhosis is only a variety of mechanic stagnation icterus. In purulent cholangitis a destruction of the walls of the biliary capillaries apparently occurs, and the bile escapes into the spaces between the hepatic cells, and thus reaches the perivascular spaces. In chronic congestion of the liver the solid parts of the bile are deposited in the biliary capillaries and ampullas, forming so-called "bile thrombi." These thrombi obstruct the flow of bile and produce the phenomena of stagnation icterus. This is accentuated by the development of periportal connective tissue, which tends to compress the biliary passages. When the central parts of the acini become necrotic, as a result of the pressure of the dilated blood-capillaries, the biliary capillaries are also destroyed and the bile finds free access into the perivascular spaces and thus into the blood. Finally, the absorption of bile in the organism occurs through the lymphatic system.

Zonal Necrosis of the Liver.—The observation of several instances in which hyaline necrosis of the hepatic cells was limited to a circular intermediate zone separated by intact parenchyma both from the portal space and from the central vein has led E. L. Opie¹ (Baltimore) to investigate the location of similar coagulative necrosis in a considerable number of cases. From these investigations and from a general consideration of the subject he concludes that it is probable that necrosis of the middle zone of the hepatic lobule or of the combined middle and central zones is an early stage of the process which has its termination in acute yellow atrophy. The former lesion is, however, so frequently the result of grave infection, notably of acute general peritonitis, that death follows before secondary changes in the altered liver are possible. The liver is enlarged rather than atrophied, and the characteristic symptoms of acute yellow atrophy are not present during life. In one instance of zonal necrosis jaundice was observed at autopsy, but had so recently appeared that it was not recognizable before death.

Comparative Studies in the Pathology of the Liver.—R. Tischner² studied the effects produced in the liver of the rabbit by ligation of the arteries and excretory ducts and by poisoning with phosphorus. After ligation of the hepatic artery the only cause of the subsequent necrosis is

¹ Jour. of Med. Research, 1904, xii, 147.

² Virchow's Arch., 1904, Bd. clxxv, Heft 1, S. 90.

thrombosis of branches of the portal vein; the sublobular form of necrosis is produced by increase of the leukocytes with leukocytic capillary thrombosis, as a result of the diminution in the driving power of the blood. There is no general hyperplasia of connective tissue, but a circumscribed hyperplasia occurs in large infarcts, and in places where there is a mild stagnation of bile, the latter being the result of increased pressure in the capillaries of the hepatic artery. Fat is increased in the necrotic regions, but only in the neighborhood of the hyperemic border-zones. On the other hand, it is diminished in the interior of the lobules, on account of the decrease in the amount of blood. After ligation of the ductus choledochus the subsequent necrosis is due to a lack of blood-supply. The latter is caused by the stagnation of bile offering resistance to the movement of blood in the portal-vein system. A general hyperplasia of connective tissue occurs, beginning at the periphery of the lobules, owing to increased pressure in the capillaries of the hepatic artery. If the resistance in the interior of the lobules becomes diminished later, a rise of capillary pressure here is likewise followed by hyperplasia of the connective tissue. The behavior of the fat is the same as after ligation of the artery. In both cases the liver becomes smaller, on account of the diminution of the amount of blood in the lobules.

After phosphorus-poisoning of short duration, with large doses, the only form of necrosis is sublobular; the capillaries throughout the liver, and especially in the necrotic regions, contain a markedly increased number of leukocytes. This, with the general congestion, shows that the poisoning has caused a slowing of the blood-stream in the capillaries. All these changes can be explained only by a chemic irritation of the splanchnic nerve. The increase in fat throughout the liver arises by synthesis from the increased transudate, resulting from the general hyperemia. If the phosphorus is given in smaller doses over a longer period of time, a hyperplasia of the hepatic cells and connective tissue is produced. This arises likewise through irritation of the blood-vessel nerves from a uniform hyperemia of low degree. The blood-stream, instead of becoming slower, may be more rapid. It is owing to this characteristic of the hepatic circulation that the fat of the liver disappears. If death occurs from this form of poisoning, it is preceded by the formation of sublobular necrotic areas, produced by a transition from the milder to the more severe circulatory disturbances, as seen in acute phosphorus-poisoning.

Carcinoma of the Biliary Passages; Adenoma and Primary Carcinoma of the Hepatic Cells.—B. Fischer¹ reports 3 cases of primary carcinoma of the liver, in all of which the origin of the tumor from the biliary passages could be demonstrated. In the first 2 cases the tumor-cells were evidently identical in form and arrangement with the cylindric epithelium lining the biliary passages. In the third case the cells were like the hepatic cells; but Fischer explains this as a repetition of what occurs normally in embryonal life, when the liver-cells develop from branches of the biliary ducts. He believes that primary cancer of the

¹ Virchow's Arch., 1903, Bd. clxxiv, Heft 3, S. 544.

liver always develops from these ducts, and never from the hepatic cells, as is maintained by some observers. In the first stages of growth the cancer retains the form of glandular ducts, later forms solid tubes, and finally develops trabeculas resembling hepatic tissue. Fischer does not believe it possible for tubular and glandular growths, as in adenoma and adenocarcinoma, to develop from the hepatic cells.

Accessory Pancreas.—C. Thorel¹ describes the histologic appearances in 7 cases of accessory pancreas. Three were in the wall of the stomach, 3 in that of the intestines, while in the seventh case there was one gland in the jejunum and one in the mesentery. The histologic structure of these accessory organs did not always correspond with that of the main pancreas. The chief difference lay in a comparative scarcity of glandular parenchyma, while the efferent and collecting tubules were longer and more numerous. The islands of Langerhans were altogether wanting. Thorel believes that these differences are due to an imperfect development of glandular tissue in the accessory organs. Excretory ducts were demonstrated in 5 of the 7 cases. Accessory glands are found normally in some of the lower vertebrates, and the condition in man has been regarded by some observers as an atavistic tendency. [It is possible that certain peculiar tumors of the stomach and intestine may arise from ectopic pancreatic nodules.]

Structural Changes in the Pancreas, and Their Relation to the Presence or Absence of the Spleen in Dogs.—G. Fichera² finds that the removal of the spleen in dogs produces no differences in the histologic appearance of the secreting cells of the pancreas, either during the various periods of digestion or in a fasting condition. The production of the tryptic zymogen is, therefore, independent of any influence exerted by the spleen. The islands of Langerhans likewise are independent of the spleen in their function. The epithelium of the efferent ducts of the pancreas is shown to be capable of forming a secretion the properties of which are controlled by the spleen. The latter organ produces an oxidizing enzyme, which is poured into the circulation, especially during digestion. This enzyme exhibits its activity in the lumen of the efferent ducts, in converting the zymogen granules and developing the proteolytic property of the pancreatic juice. Removal of the spleen in dogs renders the secretion inert toward albuminoids, and robs it of its oxidizing property.

Histogenesis of Primary Carcinoma of the Pancreas.—S. Fabozzi³ has studied 5 cases of primary carcinoma of the head of the pancreas. They were all of the scirrhus variety, containing epithelial cells with an acidophile reaction. Where the transition occurred from pancreas to neoplasm there was found an increase in the islands of Langerhans. At first there was merely a proliferation of their cells; then they fused with one another to form larger cell-nests, and finally they fused with the elements of the tumor, sharing with them all the histologic and micro-

¹ Virchow's Arch., Bd. clxxiii, Heft 2, S. 281.

² Ziegler's Beit., 1903, Bd. xxxiv, Heft 1, S. 104.

³ Ziegler's Beit., 1903, Bd. xxxiv, Heft 2, S. 199.

chemic properties. At the same time the glandular tissue gradually disappeared as the tumor was approached; a hyperplasia of the alveoli was never noted. It is thus evident that the elements of the neoplasm arose from the islands of Langerhans. This seems to be contrary to the opinions of previous investigators, who almost invariably ascribe the origin of pancreatic carcinoma either to the secreting glandular cells or to their efferent ducts.

NERVOUS AND MENTAL DISEASES.

By ARCHIBALD CHURCH, M.D.,
OF CHICAGO.

GENERAL SUMMARY.

A study of the sensibility of bones in the various conditions marked by sensory disturbances, as tested by the tuning-fork, has not resulted in very much of practical value, but furnishes a symptom of a certain worth in the general picture of sensory disturbances perhaps useful in the estimation of malingering. A number of important articles have appeared in relation to nervous phenomena as associated with physical disease; for instance, the nervous phenomena of movable kidney, the reflexes in uremia, the mental phases of myxedema, etc. A number of important articles have also been furnished in reference to the reflex phenomena in health and disease. The subject of sleeping-sickness has received much attention, and the etiology and nature of the disorder seem now to be established. Much of interest has appeared on the subject of locomotor ataxia, the strife still going on in relation to the etiology being based solely on syphilis. The subject of lesions of the spinal cord has received additional light, as is shown by articles on tuberculosis of the spinal cord and arteriosclerosis of the spinal cord. A great deal of work has been done on the subject of trifacial neuralgia, mainly in the direction of treatment, peripherally, by injections of osmic acid and, centrally, by operations, especially those directed to the division of the sensory root. A very important contribution on the subject of sensory disturbance of the fifth cranial nerve has also appeared. Considerable work has been done on the subject of tuberculosis of the nervous system. Many cases of brain-tumor have been reported during the year, and the operative technic, as well as diagnostic investigation by means of the x-ray, has received valuable contributions. The subject of tetanus embraces a large number of reported cases of intraspinal and intraneural injections of antitoxin, without advancing the status of that procedure materially over a year ago. A good deal of work has been done on the ductless glands, with especially important contributions on the subject of the parathyroid. Epilepsy has furnished a large amount of literature during the year. New observations in this trite and well-known field show that there is decided room for changes of opinion in regard to the various features of the attack, as well as upon the usually hopeless prognosis which is entertained.

SYMPTOMATOLOGY AND SYMPTOMATIC DISORDERS.

Bone Sensibility.—P. C. Knapp,¹ calling attention to the sensibility of the bones as aroused by the use of the tuning-fork, originally described by Déjerine and Egger, presents an important study as to the use of this test. He observes that there is no necessary relation between bone sensibility and other forms of deep sensibility. For instance, in paresis of the right leg following fracture of the skull and other brain-injury, sensibility to touch and pain and the bone sensibility were normal, while there was great impairment of the sense of motion, position, and localization. It appears, therefore, that bone sensibility is an independent form of sensibility having no necessary relation to other forms. The course of the fibers conveying this sensation is not determined. These fibers, after reaching the cord from the peripheral nerves, ascend uncrossed in the gray matter. He found bone anesthesia on the same side as loss of muscular sensation in Brown-Séquard paralysis, and he holds that bone anesthesia in syringomyelia indicates that the sensory tract is in the gray matter. This, however, is not proved. The chief significance of the loss of bone sensibility seems to be in connection with arthropathies and spontaneous fractures, in tabes and syringomyelia, as showing the sensibility of the bones to injury and also indicating that one more sensory factor must be taken into account in studying the physiology of coördination of movements. It is particularly in tabes that reduced bone sensibility is observed.

A. Rydel and W. Seiffer² contribute a number of observations on investigations of the sensibility of bones as decided by the tuning-fork. They come to the conclusion that the perception of such vibrations is a special sort of sensibility. They found that in cases of hemianesthesia the perception of the tuning-fork when applied to the bones stopped sharply at the middle line of the body, and that this perception of the vibrations of the fork is not identical with the sense of touch. In making the test a number of elements enter into the perception: (1) The contact of the fork with the skin. (2) The amount of pressure exerted. (3) The temperature of the tuning-fork. (4) The feeling of vibration, which, in general, patients can clearly differentiate from the other 3. They term this particular sense "pallesthesia," and vary it, as pallanesthesia, hypopallesthesia, etc. As a practical point of considerable importance they notice that pallesthesia may be modified in the very early stages of ataxia.

Nervous Complications and Sequels of Smallpox.—C. J. Aldrich³ reports 3 cases in which certain complications of this character appeared. From his review of the literature it is evident that all provinces of the nervous system are likely to suffer. Convulsions are often seen in children, usually preceding the eruption. According to Trousseau and Sydenham, they occur more frequently as precursors of smallpox than in any of the other exanthematous diseases. The mind is often affected, the manifestations being delirium and various psychoses. Meningitis seems to be

¹ Jour. Nerv. and Ment. Dis., Jan., 1904.

² Arch. f. Psychiat., 1903.

³ Am. Jour. Med. Sci., Feb., 1904.

another complication; it is usually, however, purulent and secondary to skin-lesions. Various cerebral palsies are rather frequently noted, and they may occur at any period of the disease from the onset of the infection to its latest phase of convalescence. The prognosis of these various palsies is rather good. They seem to be due to a nonpurulent meningo-encephalitis, as was shown, for instance, by Wagner. Areas of simple softening and hemorrhage have occurred. Involvement of the cord is not infrequent. Trousseau observed that with the initial lumbar pains a slight degree of paraplegia was often present, and others have observed acute ataxia following smallpox. Disseminated sclerosis, disseminated focuses of inflammation in the cord, poliomyelitis, and various paraplegias have been reported. Rapidly ascending myelitis presenting the clinical symptoms of Landry's paralysis has been observed a number of times. Finally, disease of the various peripheral nerves and multiple neuritis are on record.

Psychoses of Pernicious Anemia.—H. Marcus¹ calls attention to the psychoses observed by him in a case of pernicious anemia that presented certain peculiarities. He directs attention to the fact that most of the text-books dealing with the subject of pernicious anemia make practically no reference to the mental state of the condition, except perhaps a statement of forgetfulness and general lack of mental tone. In his patient the condition imitated quite closely the mental picture of general paresis. The patient was expansive and visionary as to possessions, careless in expenditures, satisfied with himself and his physical condition, sleepless, and irritable. Examination of the blood showed a distinct type of pernicious anemia, which, however, improved under the use of arsenic, so that the patient made a fair recovery and 2 years later had maintained the improvement. With the better condition of the blood the mind cleared and the patient had remained perfectly rational at the end of the period mentioned. [This observation is valuable, but the case is singular. The mental state in pernicious anemia is one of considerable importance and often of diagnostic value. In advanced conditions of this sort there is a tendency for the patient to awake confused. This state has a tendency to persist for a varying period of time from a few minutes to a few hours, during which the patient may not recognize his surroundings, attendants, or relatives. There is no wild delirium—simply a sort of somnambulism. Gradually the patient recovers possession of his waking faculties, and the same phase may be repeated after the next sleep or after the next slight nap, or only after a period of days. There is also a decided tendency to the development of hallucinations of sight, with illusions, so that the wall-paper often presents fantastic figures, or objects are seen in a distorted manner. The passage of time is also noted with less keenness than in ordinary illnesses, and the whole mental aspect of the patient is marked by a certain amount of apathy.]

The Tendon-reflexes in Uremia.—W. M. Stevens² calls attention to the condition of the deep reflexes in uremic states. He says that when we consider that convulsions, twitching, and restlessness are common

¹ *Neurolog. Cent.*, May 16, 1903.

² *Brit. Med. Jour.* Jan. 16, 1904.

symptoms in uremia, it seems probable that an exaggeration of reflex activity would be present, and he has satisfied himself that such is the fact. The condition may show itself not only by the exaggeration of knee-jerks, but in severe cases ankle-clonus and wrist-clonus may be present and well marked. In comatose states he believes that an examination of deep reflexes may often prove of assistance. Having found exaggerated knee-jerks, ankle-clonus, and other signs of myotatic irritability, a diagnosis of uremia may be made. The absence of such irritability would not be a negative sign. In convulsive affections, particularly those due to granular kidney, in which certain symptoms may be present, an exaggerated reflex excitability should lead to the suspicion that uremia was impending, and make one cautious in giving morphin.

The Nervous Phenomena Associated with Movable Kidney.—W. Sinkler¹ reports interesting observations with regard to the nervous phenomena which attend movable kidney in some instances. He says: "Probably the most constant nervous disorder in a patient with displaced kidney is neurasthenia. Such patients are thin, and in addition to general neurasthenic symptoms, suffer from much gastric disorder. There are in some cases attacks of severe epigastric pain with retching, like the gastric crises of tabes, and often there is gastric pain which comes with regularity 1 or 2 hours after eating, and large quantities of gas are belched up, simulating gastric ulcer. The usual remedies for indigestion and flatulence afford little or no relief. Some patients find that lying down and kneading the right side gives ease. Bloating from distention of the bowels with gas is a common symptom, and this is frequently accompanied with palpitation of the heart and pain in the precordia. These patients also have more or less pain in the region of the affected kidney, which is generally of a dull, aching character, and is often attributed to intestinal disturbances. The patient sleeps badly and the sleep is broken and disturbed by dreams. Any form of exercise, even walking or driving, is liable to cause pain and aching in the right hypochondrium and considerable exhaustion. Patients with movable kidney are also extremely nervous and irritable, and are often in a condition which makes them not only uncomfortable to themselves, but a burden to their friends. In some cases the various manifestations of hysteria may be presented. I recall one patient whose right kidney was so much displaced that it could be readily outlined in the region of the umbilicus, who had severe hysteric seizures in which she became unconscious and raved. There are various reflex hysteric disturbances met with in movable kidney. Of course, there may be only an accidental association between these conditions, but from the fact that after an operation for fixation of the kidney these symptoms disappear, it is evident that there is more than a coincidence between the symptoms. Hypochondriasis and mild mental disturbances like melancholia are sometimes associated with movable kidney, but these conditions occur only in cases of long standing. These nervous phenomena rarely occur in men, but when they are met with in that sex, they are very intense. The treatment of movable kidney is palliative or radical. In a

¹ Jour. Am. Med. Assoc., Feb. 13, 1904.

certain proportion of cases the application of abdominal belts with properly adjusted pads seems to afford relief, but in the majority of instances the use of any kind of apparatus is entirely unsatisfactory, as it is most difficult to get a belt which can be made to fit accurately. Many cases in which the amount of displacement is moderate in degree are greatly benefited by the rest treatment, and even cases in which there is a considerable displacement of the organ are distinctly benefited by such a plan of treatment. Every case of displaced kidney should have the benefit of systematic and intelligently directed rest treatment before resorting to operation. All the procedures connected with the rest treatment tend to benefit cases with movable kidney. As long as a patient is on her back, the kidney remains in a normal position. By improving the general nutrition of the body the weight is increased, and this will add to the deposit of fat in all the tissues and restore that which has been lost by absorption from the envelop of the kidney, and thus secure it in its proper condition. In addition to these mechanic influences from rest treatment, the isolation, regimen, and moral influences which are brought to bear on the patient relieve the nervous and neurasthenic symptoms which are present in almost every instance. In cases in which there is true floating kidney or much displacement of the organ, and in which the rest treatment has been faithfully tried without benefit, operation should be resorted to. There are also cases in which, for various reasons, it may be undesirable to adopt rest treatment, and in these nephrorrhaphy may be resorted to at once. The ultimate results of nephrorrhaphy as regards the symptoms depend to a considerable extent on the nature of the case. The pain, weight, and dragging are almost invariably relieved by an operation. The immediate effect on disorders of the digestive system is not always satisfactory, and it often is a considerable length of time after the operation before these symptoms are relieved. Flatulent dyspepsia and constipation often remain for a long time, and the same may be said of the nervous phenomena. Few cases are immediately relieved of neurasthenic and hysteric symptoms after operation, and it is not reasonable to expect that such symptoms would disappear at once. As a rule, they have lasted for a long time, and the neurasthenic and hysteric condition has become established in the individual. We cannot, therefore, expect that these symptoms will be relieved without suitable treatment being pursued for a reasonable length of time. It is, in operations for movable kidney, just as it is in operations for ovarian disease in patients who have become neurasthenic: the cause of the trouble may have been removed, but the disease which has been induced does not disappear without proper treatment."

Diagnostic Value of Certain Reflexes.—H. Oppenheim¹ considers that the absence of the knee-phenomena very rarely occurs in individuals without being symptomatic of organic disease, constituting in such conditions a stigma of degeneracy and usually associated with other physical stigmas of the same condition. In the course of many years he has known 2 or 3 individuals in whom from early youth this could not be

¹ Med. Rec., Jan. 2, 1904.

demonstrated—once in a neuropathic individual with various anomalies of development. In the second instance both mother and daughter showed an absence of knee-jerk and the presence of other stigmas. The absence of knee-jerk in children of syphilitic parents seems in certain rare instances to be the only manifestation of syphilitic contamination. On the whole, the differentiation of this reflex constitutes a symptom of the greatest value in the recognition of diseased conditions. Many things may interfere with its development: obesity, diseases of the knee-joint characterized by swelling and deformity, marked edema, advanced genu valgum, or an extremely short patellar tendon may prevent the appearance of the knee-jerk. The heel-phenomenon manifested by tapping the Achilles tendon has of late attained a position of decided importance. If the individual under examination is placed in the kneeling position, this reflex can be regularly elicited. It is a constant reflex in health. Sciatic neuritis causes its disappearance, and as sciatica is a widespread disorder, the absence of the heel-jerk upon one side has not the same significance that the loss of the knee-jerk would have, particularly as it may remain permanently absent after recovery from the sciatica. Deformities of the foot or any other condition which interferes with the tonicity of the calf-muscles may cause a weakening or a disappearance of the reflex. Traumatic affections of the ankle-joint and marked development of varicose veins have a tendency to reduce or abolish the heel-jerk. These conditions being excluded, the absence of the heel-jerk is one of the most important signs of incipient tabes, often being present before the knee-jerk disappears. Alcoholism, diabetes, and other conditions producing multiple neuritis may, however, cause its early disappearance. The sole-reflex, of all the skin-reflexes, has attained the most importance in recent times. This is due to the efforts of Babinski, who called attention to the action of the toes upon stimulating the skin of the sole and differentiating between the movement of the foot and that of the toes. Under ordinary circumstances, upon stimulating the plantar surface, the foot is retracted by dorsal flexion and the toes are thrown into plantar flexion. Under certain pathologic conditions stroking the sole of the foot results in dorsal extension of all the toes, but particularly of the great toe. This sign is found in cases of spastic paraplegia of both the spinal and the cerebral type, and apparently is a manifestation of the hypertonicity attendant upon such conditions. But there are also conditions of reduced tonus and even of atony of the leg-muscles associated with absence of tendon-reflexes in which the Babinski symptom is present. We find the Babinski symptom in affections which are marked by systematized or localized degeneration of the pyramidal tracts, a condition leading to the symptom-complex of spastic paralysis. But the Babinski symptom is not inseparable from spastic paralysis. For instance, in affections which are not alone confined to the pyramidal tracts, but involve other areas of the cord and nervous system, inducing an antagonistic influence of the muscle-tone, such as combined lateral and posterior sclerosis, Friedrich's disease, and the combination of tabes dorsalis with hemiplegia may cause lost tendon-reflexes and the Babinski

sign. The same is true of combinations of disease of the anterior horn in the pyramidal tract, as in amyotrophic lateral sclerosis, the Babinski symptom alone indicating degeneration of the pyramidal tracts. In the ordinary form of hemiplegia the Babinski symptom is present, as a rule. The Babinski symptom is also present in the first year of normal life, owing to the undeveloped condition of the pyramidal tract. Oppenheim believes we are not justified in concluding that the Babinski sign indicates anatomic change in the pyramidal tract, because epileptics after an epileptic attack occasionally present Babinski's sign. So a peripheral disease or a poliomyelitis may prevent flexion of the toes, and the reflex will give an extensor sign without necessary implication of the pyramidal tract.

In the normal individual, upon stroking the inner surface of the leg from above downward with the hand or percussion-hammer or by pinching the surface of the skin on the inner surface of the leg, commonly flexion of the toes results. In pathologic conditions affecting the pyramidal tracts, instead of flexion of the toes there is extension of the foot and toes. This reflex condition differs from Babinski's not only in the method of eliciting it, but particularly in the fact that not only the long extensor of the great toe, but the extensors of the foot—namely, the tibialis anticus and often the common extensors of the toes and the peroneal muscles participate. Only under diseased conditions does this extension phenomenon appear. In those cases where the Babinski is uncertain this sign is usually decisive.

The Human Plantar Reflex.—A. McAlldowie,¹ in a paper read before the Royal Society of Edinburgh, states that the human plantar reflex possesses the distinctive features of adaptation. It is a movement of defense or irritation adapted to withdrawing the part from the source of irritation. The purely spinal plantar reflex is seen in the case of the infant before it commences to walk. If the sole of the foot is tickled, the great toe is at once drawn upward in extension, and the remainder of the toes are extended and separated, the foot is everted, and the ankle dorsiflexed, after which knee and hip are drawn up. The infant foot has a tendency to make prehensile or grasping movements, as in the ape, and the grooves in the foot of the infant and on the foot of the ape show the same general arrangement of transverse and longitudinal lines. After the foot becomes an organ of support and locomotion the character of the grooves indicates change, the primitive lines are smoothed out, and a new set makes its appearance. The plantar extensor reflex of the infant is a modified prehensile reflex, as it withdraws the foot from irritative contact with objects, and Collier has shown that this reflex is precisely similar to the plantar reflex of monkeys. If, however, we stimulate the sole of the foot of the child after it has learned to walk, the character of the movements elicited is the opposite of the preceding: the thigh is the first to respond, then the ankle is dorsiflexed and the foot is adducted, and the foot is inverted. This is

¹ Brit. Med. Jour.,

gradually developed as the use of the limb is acquired for support in locomotion. Thus in plantigrade progression if an irritating object comes in contact with the sole of the foot, the hip, acting at a greater mechanic advantage than any other group of muscles, withdraws the foot from the offending object, while the flexion of the toes and inversion of the foot render the skin of the sole lax, so that any object will penetrate less readily. This second stage reflex appears in perfection only after the second year. The reflex function of the early or primary lumbar center is not destroyed, but modified, and if the inhibitory influence of the higher and later center is withdrawn, the primary reflex is manifested. If, therefore, owing to disease, the secondary reflex is destroyed or abolished, the primary reflex is reasserted in the form of the well-known Babinski sign. Such abolition may be brought about by uremic or alcoholic poisoning, by severe epileptic fits which produce brain-exhaustion, or by disease affecting the pyramidal motor cortical cells.

Epidural Injections.—A. Strauss¹ recommends that certain disorders of the genitourinary system can be satisfactorily treated by epidural injections. These apparently owe their effect to irritation of the roots of the cauda, which, by spreading to the spinal centers, changes their functional condition. He believes that the particular fluid employed in these injections is of no importance, but that cocain is not necessary. The method seems to be particularly indicated in enuresis. Some cases of sexual neurasthenia have shown improvement, probably due to the suggestion. Temporary relief has been given in severe cases of pruritus pudendi. The number of injections have varied from 1 to 10 in different cases. He believes that this treatment is indicated in enuresis, incontinence of adults, spermatorrhea, neuropathic polyuria, etc.

In 1901 Cathelin published his **method of treatment of enuresis** by epidural injections, the discovery of which he made accidentally. He attempted to produce analgesia by injecting cocain into the sacral canal, so as to bring its effect upon the cauda equina. The result was not analgesia, but retention of urine. He then applied epidural injections to cases of abnormal frequency of micturition and enuresis. Fifteen cases of incontinence of urine of varying origin were treated by injections of 1 cm. of a 2 % solution, or by 15 to 20 cc. of normal salt-solution. In 5 cases of nocturnal enuresis in children 3 recovered immediately after the first injection and improvement followed 2 or 3 injections in the remainder.

Kapsammer² has treated 37 cases by this method. The course was completed in 25, was interrupted in 6, for various reasons, and in 6 was still in progress. In all the completed cases the result was satisfactory. The technic is simple: A needle, 6 cm. in length for adults, is inserted between the cornua of the coccyx and directed upward through the sacral canal through the membrane which closes its lower end. The injected fluid surrounds the nerves of the cauda equina, but does not enter the dural sac. Kapsammer found normal salt-solution to be as efficacious

¹ Therap. Monats., Feb., 1904.

² Wien. klin. Woch., July 16-23, 1903.

as cocaine. In more than 300 injections made in the out-patient's room, unpleasant after-effects were seen only twice.

Resection of the Cervical Sympathetic.—J. M. Ball¹ discusses the influence of resection of the cervical sympathetic in optic-nerve atrophy, hydrophthalmos, and exophthalmic goiter, basing his opinion upon the reports in literature and his own experience. He concludes: (1) Excision of the superior cervical ganglion of the sympathetic nerve is worthy of a trial in those cases of simple atrophy of the optic nerve which resist measures less heroic. (2) It is yet impossible to say whether the bilateral operation is advisable in unilateral optic-nerve atrophy. (3) The value of sympathectomy in congenital hydrophthalmos has not been demonstrated. (4) In exophthalmic goiter complete excision of the cervical sympathetic is followed by a larger percentage of cures than is any other procedure. Thus far no deaths have been recorded. The number of operations, however, is small, and final conclusions can be announced only after a large number of cases shall have been treated by this method. In the same number of the same journal J. E. Weeks, under the head of "Pathology of the Cervical Sympathetic," says that the testimony in our possession is not sufficiently classified to enable us to say there is any constant change in the cervical sympathetic peculiar to glaucoma, nor is it sufficiently classified to exclude the possibility of such constant change. Further and more careful research is necessary.

Family Periodic Paralysis.—G. E. Holtzapple² describes this rare affection. He says: "My observations have been made during the last 20 years. The characteristic symptoms and clinical phenomena of the cases heretofore reported, by European and American observers, are similar to those which characterize these cases. In the cases thus far reported I have failed to learn of any deaths due to this disease, and, on the contrary, I believe the disease is not considered serious. Of the family of which I write a number have died in an attack, and many have suffered from periodic sick headache, which I always regarded as equivalent to an attack of paralysis, both having a common cause, whatever that may be. When one of these patients suffers from complete paralysis he is utterly helpless, cannot move a finger or toe, neither lift nor turn the head on the pillow, and, if unsupported, it either drops on the sternum or backward between the scapulas. In some instances breathing becomes distinctly labored, and deep breathing, cough, and vomiting are impossible. The bowels almost never move, and urine is seldom voided during an attack, unless the bladder is overdistended. There are absolutely no psychic symptoms. The mind remains perfectly clear, and in a patient who died in my presence it was clear until the last moment. The onset is almost always at night, and is ushered in during sleep, with either very slight or no premonitory symptoms. The patient may retire with a feeling of weakness in the extremities, which usually comes on toward evening, or he may have a voracious appetite, which, if appeased by indulging in rich food, is sure to precipitate an attack. On waking he may find himself helpless, able to speak and swallow, but unable to move

¹ Jour. Am. Med. Assoc., Jan. 30, 1904.

² Amer. Med., Apr. 30, 1904.

head, extremities, or trunk. In some cases speech, deglutition, and breathing may be affected. None of the special senses has been involved in these cases. There are no sensory symptoms, save in some instances formication and numbness in the paralyzed parts, also a sense of heaviness and a tired feeling, which at times becomes very annoying to the patient, and of which he is greatly relieved by frequent change of position. Patients during an attack usually have no desire for food, some suffer slight nausea, but they usually take nothing but water until they have fully recovered. In an ordinary attack the circulation remains good; the color of the lips and finger-nails is normal, and capillary circulation is not sluggish. During a very severe attack I have seen the pulse weak and irregular, with evidence of cardiac dilation. Most of these patients during an attack complain of absolutely nothing except that they are helpless. The duration of these attacks may be a few hours, or 1, 2, and, in rare instances, 3 full days. Improvement may be abrupt and of very short duration, or it may require 3 or 4 hours, or even a half-day. Vomiting and one or two loose movements of the bowels sometimes occur during the period of improvement. Some of these patients contend that forced exertion aids materially in hastening improvement or in warding off an impending attack. The first symptom of improvement is simply the ability to produce slight muscular contraction here or there, may be in a finger or toe, soon followed by ability to move a large portion of the part involved. Some will complain the day following of an attack of muscular soreness, especially if they had to be handled much. Others do not complain of anything following an attack. It is nothing uncommon for one of these patients to be as helpless as a log at 7 a. m. and at 11 a. m. be engaged in doing a hard day's work, not feeling the slightest inconvenience from having been completely paralyzed a few hours before. In some improvement is more rapid when it begins in the upper extremities, and in others when it begins in the lower. Some can predict for a certainty an impending attack, others cannot. A heavy meal, especially in the evening, is sure to precipitate an attack in some, while others are not affected by the quality or quantity of the food taken. The number of this family who have had attacks of paralysis is 16. Eighteen have been affected with sick headache. Five have had attacks of paralysis and headache. Eleven members have had attacks of paralysis alone, and 13 have had attacks of only headache. The total number affected with either attacks of paralysis or of headache or both is 30. Six of the number reported died in an attack, 1 death occurring in my presence. In 5 of these cases the disease was transmitted through one of the parents having had only sick headache; and in 1 instance the father had attacks of paralysis and finally died in an attack. Believing that the attacks of hemi-crania and paralysis in this family have a common cause, and on the assumption that both conditions are a vasomotor neurosis, I resolved to try large doses of bromid with caffein. I began this treatment 18 years ago, immediately after witnessing a death reported in this paper. The dose of bromid usually consisted of 2 gm. ($\frac{1}{2}$ dr.) of potassium bromid with 0.065 or 0.13 gm. (1 or 2 gr.) of caffein citrate; and this dose

was repeated, if necessary, in 1 or 2 hours. This seemed to give unmistakable relief, so that from this time on most of those who were subject to this disease kept the medicine on hand, and, without exception, these patients were certain that while it did not cure, it did have a very decidedly abortive influence, and hastened improvement when taken during a paroxysm. Those suffering from hemicrania seldom take anything for fear their headache may cease and they become subject to attacks of paralysis, for in a number of the cases reported it has plainly been shown that these attacks are but the equivalent of an attack of paralysis."

Sleeping-sickness.—G. C. Low and F. W. Mott¹ describe and illustrate the changes found in the tissues of a case dying from sleeping-sickness. It appeared that a European who had resided in a country where sleeping-sickness had existed left with trypanosomes in his blood, but for a considerable time presented no symptoms of the disease. It then developed and he died, the tissues showing changes similar to those shown by Africans and reported by others. The changes in the central nervous system were briefly as follows: "*Membranes:* The pia-arachnoid membrane showed an infiltration, with large and small celled mononuclear leukocytes of a not very marked character in the sections of the cortex, but much more marked in those regions where there is a larger amount of cerebrospinal fluid—for example, the cerebellum and the medulla. *Vessels:* In the cortex the small vessels, especially the capillaries, frequently show swelling and some proliferation of the endothelial nuclei; this, however, is more marked in some places than in others. The blood contained in the vessels exhibits usually an excess of mononuclear leukocytes; in some places groups of polynuclears are seen. Around the vessels are found the characteristic mononuclear infiltration first described by one of us (Mott), and since confirmed as pathognomonic of this disease. This infiltration is much more marked in some portions of the cortex than others, but it is very well marked in the cerebellum and the medulla oblongata. The vessels of the medulla and spinal cord are congested, and in places, especially in the former, there are many recent capillary hemorrhages. *Nerve-cells:* The ganglion-cells of the cortex and of the medulla, to a much less degree the spinal cord (in which latter the vascular changes are not marked), show acute changes, probably of the nature of coagulation-necrosis. The cells are by no means all affected, nor to the same degree. There is chromatolysis, the Nissl granules being indistinct, absent, or a dust-like powder, with absence of the granules on the dendrons, which may be broken off, or not exhibiting their normal forms. The changes, in our opinion, are mostly of recent origin, and, like the capillary hemorrhages, were due to the toxic conditions of the blood and cerebrospinal fluid caused by the invasion of the diplococci to be described. *Glia tissue:* The neuroglia cells in places show active proliferation. *Organisms:* No trypanosomes were found in the bloodvessels or perivascular spaces of the central nervous system, although a large number of sections were examined. In the superficial cortex in some sec-

¹ Brit Med. Jour., Apr. 30, 1904.

tions small focuses of leukocytes, mononuclears, and polymorphonuclears were found. Several of these focuses exhibited no diplococci, but curious granules of varying size, as if these may have been the cause of the inflammatory action. We would not venture to say that these were degenerated trypanosomes, but it is possible that they may have been such. Similar bodies were found amid the cells in the perivascular spaces of the medulla and cerebellum. The magnification (500 diameters) is not sufficient to show these small round bodies distinctly. Under a high power, however, no differentiation of structure can be made out. It is, therefore, impossible at present to do more than record the fact of their existence. In all parts of the central nervous system, as indeed in all the organs and tissues, diplococci (staining by Gram's method) could be found. By Marchi staining numerous recently degenerated fibers could be found in the medulla, spinal cord, and cortex. The microscopic examination, therefore, of the nervous system shows changes similar to those which have been met with by us in cases of the disease occurring in Africans."

E. D. W. Greig¹ states that in an examination of the contents of the lymphatic glands during life taken from 15 cases of sleeping-sickness, in all actively motile trypanosomes are readily found in cover-glass preparations. The glands were taken from either the neck or the groin. Trypanosomes were more numerous in the glands than in the blood or the cerebrospinal fluid. This method is satisfactory for diagnosing early cases of sleeping-sickness.

Erythromelalgia.—A. S. Hamilton² reports a case of erythromelalgia with postmortem findings. In a general way these point to the fact that the arterial disorder is more prominent than the nervous state. In other instances on record there was abundant evidence of arterial disease, with no degeneration of the nerves, and in Hamilton's cases the disease of the arteries was out of all proportion to the degeneration of the nerves. The spinal cord was not affected, showing that affection of the spinal cord is not a necessary accompaniment of erythromelalgia, as has been indicated by some observers.

Associated Movements of the Upper Eyelid and the Lower Jaw.—E. A. Coburn³ describes fully, with illustrations, a marked case of this congenital anomaly. The lad, with closed mouth, has complete ptosis of the eyelid, which, however, he can partially overcome by extraordinary action of the frontalis. On opening the mouth the left eyelid raises fairly well, and synchronous action is observed in the left eyelid when the jaw is moved in mastication. Coburn has been able to collect over 50 such cases from the literature. It is probable that there is an unusual relation between the levator portion of the nucleus of the third nerve and the pterygoid portion of the nucleus of the fifth.

Lumbar Puncture.—J. Donath,⁴ in an article entitled "A Contribution to the Diagnostic and Therapeutic Value of Quincke's Lumbar Puncture," insists that an increase in the lymphocytes has an etiologic

¹ Brit. Med. Jour., May 28, 1904.

³ Med. Rec., Aug. 13, 1904.

² Jour. Ment. and Nerv. Dis., Apr., 1904.

⁴ Klin. med. Woch., Dec. 5, 1903.

relation to tabes and progressive paralysis, and furnishes a diagnostic sign of considerable value as between organic processes and the neuroses.

Hypnotism.—J. M. Bramwell,¹ in his recent book, reaches a number of conclusions which are somewhat at variance with the general opinion of the hypnotic state and its effects. He follows Braid and his later theories very closely, and discards the Charcot and Bernheim contentions to some degree. He does not believe there is any danger in the use of hypnotism if it is under anything like reasonable management, and has personally seen no evidence of danger in his practice or that of others, and has never seen even the slightest bad effect follow carefully conducted hypnotic experiments. Moreover, he does not believe that an individual can be induced under the hypnotic state to commit a criminal act against his will. On the other hand, he maintains that the normal status of the individual is invariably elevated during hypnosis, and that any attempt to mislead is less possible than in the normal condition. That when the individuals are apparently induced to do acts which they are told will result in fatalities, they carry out the directions of the hypnotizer because they clearly see that no hurt is intended. The book is one of great interest, as it shows clearly the development of the practice of hypnotism by a careful observer, and his results throughout are stated with conservative reservation. The usefulness of hypnotism has its limitation, which Bramwell clearly acknowledges, but believes that it has a greater applicability in both medicine and surgery than is commonly granted.

DISEASES OF SPINAL MENINGES AND SPINAL NERVES.

Beriberi and Multiple Neuritis.—Hamilton Wright² makes a study of beriberi in monkeys. The observation is of value in that it conclusively proves that: (a) Beriberi is an acute infectious disease. (b) The organism—as yet not known—exists in close, sunless focuses—*e. g.*, the cells of a jail in this instance. (c) No food as food, either qualitatively or quantitatively, is a factor in the production of the disease. (d) The organism is not an organism that affects or develops on food commonly used by man. (e) The organism is probably ingested with food accidentally contaminated by it. (f) It multiplies in the stomach and upper part of the small gut, causing a local congestion or inflammation, and elaborates a toxin which, being absorbed, acts with varying force bilaterally and symmetrically on certain vital and ordinary neurons to give rise to the collection of symptoms known as beriberi. (g) The incubation-period of beriberi is short. (h) Rice, either as diet or as the habitat of a living specific organism, cannot for a moment be seriously considered. These conclusions were reached after a careful experimental study of the disease in man, and is confirmed by this observation on monkeys. It but remains to detect the organism.

A. Stanley³ calls attention to sudden heart-failure and toxemic

¹ Hypnotism: Its History, Practice, and Theory.

² Brain, Winter, 1903.

³ Brit. Med. Jour., Dec. 26, 1903.

symptoms, with special reference to diphtheria and beriberi. He concludes: 1. Beriberi and diphtheria have a marked degenerative action on the heart-muscle, which frequently causes fatal circulatory failure. 2. In this respect beriberi and diphtheria resemble other toxemias, such as influenza and alcohol and arsenic poisoning, which often cause peripheral neuritis and also other toxemic diseases, such as typhoid fever, plague, and acute rheumatism, which do not, or but rarely, give rise to peripheral neuritis. 3. Beriberi and diphtheria are diseases *par excellence* in which sudden heart-failure occurs. 4. The heart-muscle degeneration is not a secondary result of neuritis of the vagus. 5. The heart-muscle degeneration takes place, as a rule, before skeletal muscle-degeneration, and is the result, probably, of direct action of the toxin, and not a secondary result of nerve-change. 6. Sudden heart-failure does not indicate a sudden lesion, but is the result rather of a gradually increasing heart-weakness from cardiac-muscle degeneration, which may be precipitated by any sudden exertion, but frequently is the result of the principle of "all or nothing," the transition from "all" to "nothing" being necessarily rapid. 7. The cardiac physical signs in beriberi closely resemble those found in diphtheria, and are of paramount importance in prognosis and treatment.

Erb's Palsy.—A. H. Tubby¹ presents a method of treating, by operation, paralysis of the upper root of the brachial plexus in so-called Duchenne-Erb brachial paralysis. This paralysis arises from difficulty at birth, fracture of the clavicle, injuries about the shoulder, and infantile paralysis. The muscles affected are the deltoid, infraspinatus, biceps, brachialis anticus, and supinator longus. There is resulting loss of power at two joints; the patient is unable to flex the elbow and cannot abduct the shoulder. There is, further, a loss of sensation in areas of skin supplied by the circumflex and musculospiral nerves. The simpler problem is to restore the power of complete flexion of the elbow; the more difficult one, to restore the power of abduction on the shoulder-joint. For restoring complete flexion at the elbow the most convenient muscle at hand is the triceps, and, fortunately, its outer head is so attached that it can be utilized for this purpose. In 2 cases this operation has been fairly successful. An incision 4 to 6 inches long was made from the middle of the back of the upper arm downward and forward toward the front of the elbow, following the course of the musculospiral groove. The musculospiral nerve is readily defined and drawn to one side. The outer side of the triceps is first detached from its connection above the olecranon; then a strip 3 or 4 inches long, adherent to the bone only at the upper extremity, is freed. The next stage is to clean the biceps muscle. An aperture is then made in its lower part, about 2 inches above the elbow, and a strip of the triceps, of considerable strength, is drawn through the biceps from back to front and firmly plaited down, the elbow at the time being well flexed. In the 2 cases in which this operation was done the power of voluntary flexion of the elbow returned in from 4 to 6 weeks. Replacement of the paralyzed deltoid is a difficult problem. In the first case in which Tubby attempted to restore the power of abduction to the shoulder

¹ Brit. Med. Jour., Oct. 17, 1903.

he used only the clavicular portion of the pectoralis major. In the second case he used both this part of the muscle and that part of the trapezius attached to the clavicle. In the first case the patient regained some power of abducting the shoulder; in the second case, in which he used the conjoined pectoralis and trapezius, the result promises to be better.

In discussing the paper W. Harris said that with V. W. Low they had reported 3 cases in which they had operated upon the fifth cervical root in the neck, 2 cases of Erb's paralysis in adults, and 1 case of infantile paralysis of the shoulder. In these cases more muscles were involved than in the instances described by Tubby. At the operation the anterior branches of the fifth, sixth, and seventh roots were exposed close to the scalenus anticus, each separately insulated and stimulated faradically, and the fifth root proved to be the one affected. This root was then cut across, and its distal end turned down and sutured into a nick made in the seventh root in one case, and the sixth in the other. Marked improvement in the galvanic reaction had already appeared in one of the adult cases, although too short a time had elapsed to determine the ultimate result.

DISEASES OF THE SPINAL CORD.

Locomotor Ataxia.—D'Orsay Hecht¹ takes up the consideration of tabes in the negro. After reviewing the literature of the subject and presenting the histories of a number of cases, he summarizes his conclusions as follows: 1. Long residence with the white man has made the American negro anthropologically, physiologically, and pathologically different from his African ancestors. 2. The constitutional variation has been wrought by acclimatization, social environment, and, more than all else, by miscegenation. 3. The influence of miscegenation and the advent of personal liberty are responsible for a new era of diseases. 4. The newer diseases in the negro, of which tabes is an example, are fast becoming more commonly recognized, miscegenation being regarded as the potent factor in reducing the negro's resistance toward disease. 5. Tabes exists in the negro perhaps more commonly than has been supposed, and failure to recognize it may be due to the abeyance or total absence of the ataxic symptoms in the amaurotic type. 6. The Edinger-Marie observations anent the optic atrophy satisfactorily explain that class of cases in which tabes is arrested by blindness. 7. Aryan admixture is essential to the production of tabes in the negro.

Bruno Oppler² reports an interesting case of tabes dorsalis marked by **crises of fever**. A man of 41 had presented symptoms of tabes for 10 years. He was subject to gastric crises, but suddenly the critical manifestations changed and vomiting ceased. He complained at such times of a great feeling of oppression, with intense lancinating pains in the legs and general prostration attended by fever. Accelerated temperature (40.4° C.) persisted for about a day, gradually receding. Six times these critical attacks of fever were observed, and it was later found that phenacetin controlled crises of this character to a considerable extent. Other

¹ Am. Jour. Med. Sci., Sept., 1903.

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² Berl. klin. Woch., 1902.

causes of febrile movement were carefully sought for and can be reasonably excluded.

G. B. Hassin¹ discusses the **Obersteiner-Redlich theory** of tabes, viz., that from the spinal roots some pathologic process extends to the pia-mater, compressing the posterior roots and producing their degeneration, with subsequent atrophy of the columns. According to Guillian and others, the posterior roots of pia-mater form a whole as regards the development of the lymphatic system, so that a process set up in one member of this portion of the spinal apparatus might easily involve the whole. It is, therefore, supposed that in tabes this lymphatic system becomes infected primarily, so that we meet in tabes the simultaneous infection of pia-mater, posterior roots, and posterior columns. It is insisted that meningitis is a constant finding in tabes dorsalis, through which the anterior roots become secondarily involved and degenerations in the cord are subsequent. Hassin insists that the degeneration is not of the Wallerian type, but has the character of an inflammatory process. He contends that Obersteiner, Nageotte, and Marie, while presenting slightly different theories, agree upon a common fact that the spinal membranes play a decided part in the production of tabes dorsalis. Bearing upon this point is the question of lymphocytosis in tabes studied by spinal puncture. Thus Widal, Sicard, and Ravaux have shown that, with proper technic, lymphocytosis is always present in tabes dorsalis and indicates an inflammatory condition of the membranes and their processes. These investigations have been confirmed in Germany by Schoenborn, working in Erb's clinic.

A. Schittenhelm² reviews the contributions to literature on the subject of the **etiology of tabes**, particularly with reference to trauma. Klemperer, in 30 cases taken from the literature and 4 of his own, reached the conclusion that trauma might be the cause of tabes. Hitzig, after carefully consulting the literature, found but 111 cases that would serve for a discussion of the question of the traumatic cause of tabes, and this material was too small to settle the question. Erb found trauma associated with tabes in 5 % of his cases, and believes that trauma contributes a small additional inciting cause in the etiology of tabes, perhaps having some influence upon the localization of the first tabetic symptoms. Nonne accepts traumatism as a very rare causal factor, while Oppenheim sees in trauma a contributory cause, agreeing with Hitzig that it may have an influence upon the course of the disease. Stern thinks that trauma alone can hardly produce tabes, and that an unknown individual predisposition is required. Schmaus expresses himself to the effect that in exceptional cases no other cause than trauma can be established. Leyden and Goldscheider declare that the reference of tabes to trauma can be made only with the greatest reserve, although the relation of trauma to tabes appears probable. Morton Prince does not believe in a traumatic tabes. Bernhardt accepts the position of Hitzig. Schittenhelm, going over the entire ground covered by Hitzig, the cases published since, and his own observations, draws the conclusion that traumatic

¹ Med. Rec., Jan. 30, 1904. ² Deut. Zeit. f. Nervenheilk., 1903, Bd. xxiv, S. 432

tabes, in the strict sense of the word, does not exist, and that in those cases in which trauma plays a part it is merely contributory, acting upon a predisposition or upon tabes already developed, which it may intensify.

W. Erb,¹ on the question of **syphilis in locomotor ataxia**, separates his patients into 2 classes—those who are educated and those who are not. Statistics gained from the former are more reliable than those gained from the latter. Dealing with men of the first class, he finds that of 1100 cases of tabes, 89.4 % certainly had syphilis, while of the remaining, presumably not infected, 10.54 %, only 2.8 % gave a history and presented signs which revealed no trace of syphilis. Comparing these figures with those gained from 10,000 persons of the same class suffering from affections other than tabes, he found that only 21.5 % gave evidence of having been previously infected, and 28.5 % revealed no grounds for previous syphilis. As to the question of the relation of gonorrhea to tabes, it appears that 90 % of the cases of tabes in educated males had had this disease, while 50 % of males of the same class, suffering from diseases other than tabes, had had gonorrhea. Of the men who had had gonorrhea and afterward became tabetic, 88 % had certainly had syphilis. As to the inquiry how many syphilitics had become tabetic, he states that undoubtedly many other syphilitic manifestations are rare, but undoubtedly syphilitic, and he reaches the conclusion that tabes is a somewhat rare postsyphilitic infection. He believes, however, that there are other conditions necessary to produce tabes as well as syphilis, such as cold, exertion, sexual excesses, congenital or acquired weakness of the nervous system; certain poisons, such as alcohol, tobacco, ergotin; certain infectious illnesses, as influenza, and probably many other factors, play a part in determining an attack of tabes. Erb believes that by the antisiphilitic treatment of certain cases of tabes many are practically cured. In conclusion he states that tabes is undoubtedly in many cases a syphilogenic affection, but at present it cannot be said for certain, although it is highly probable, that it is always such.

A. Leri,² in reference to the blindness that appears in tabes, presents a study of the condition of **the retina**. From the examination of considerable material he feels justified in the conclusion that the atrophy of the optic nerve does not begin in the retina, as has been claimed, and is not primitive in the sense that its origin is in the multipolar cells of the retina. The ophthalmoscopic appearance of the atrophy Leri believes corresponds to the anatomic findings, and confirms his belief that the degeneration of the optic nerve is secondary to changes higher up.

P. Bartholow,³ in an article entitled "**The Use of Injections of Sodium Cinnamate in Locomotor Ataxia**," concludes it is of some value, first by promoting appetite and digestion, and consequently nutrition, and, second, by setting up chemic changes in the outlying regions of degeneration, in the cells, and in connective tissues of the nerve-substances.

S. H. Friend⁴ makes an interesting contribution to the subject of

¹ Berl. klin. Woch., Jan. 4, 11, 18, 25, 1904.

² Nouv. Icon. de la Salpet., July-Aug., 1904.

³ N. Y. Med. Jour., Mar. 26, 1904.

⁴ N. Y. Med. Jour., May 19, 1904.

prostatic crises. These were observed in several patients, and by careful examination at the time by the patients and the physician it was determined that the tissues of the perineum were yielding, but not tender, at the time of the crisis; that the rectum was soft, and that there was no pain upon inserting the finger into the rectum; that the point of tenderness was situated up the rectum in the anterior wall, at a point corresponding to the prostate gland. During the crisis the bladder could be emptied without difficulty, showing that it was not particularly involved. Therefore it seems that the pain in the perineum, which is not an unusual symptom in the early stage of tabes, is due to disturbance of the prostate, and these crises may properly be called prostatic.

E. Corester¹ insists that the **diagnosis in tabes** is usually made too late, but that if one is familiar with the symptoms now generally known, a sufficiently early diagnosis can be made to secure the best therapeutic results. Among the early indications the lightning pains are almost distinctive and almost invariably mistaken. Paresthesia occurring in any situation is also an early sign; most commonly it affects toes, fingers, feet, and hands, and these feelings may be described as itching, creeping, dead, and sleeping. Disturbance of sensation in the direction of hyperesthesia or reduced sensation may also be made out objectively, and perhaps most commonly as analgesia, headache, migraine, giddiness, and fainting; apoplectiform and epileptiform attacks may also be encountered in the early phases. Ocular palsies, inequalities of the pupils, disturbance of the optic nerve, rarely disturbance of the vagus nerve, are among the early features, as are disturbance in the sensations supplied by the outer facial. Treatment is limited to the antisymphilitic. From his own experience he believes one is able to cure or improve tabes by antisymphilitic treatment, and by the same means has arrested progress in a well-advanced case of this disease. He has never seen harm follow the treatment; some cases, however, were not influenced by it, which he ascribes to the late date at which it was instituted. A detailed account of many of his cases shows that when treatment was discontinued, improvement tended to recede.

F. Lesser² calls attention to the prevalence of **aneurysm in tabes**. In 96 cases in hospital and private practice he found aneurysm in 19, or 1 in 5. Aneurysm in these cases is attributed to a preceding syphilitic factor, upon which the tabes also depends.

Tumor of the Spinal Cord.—H. Cushing³ reports an interesting case of surgical tumor of the meninges. A fibrosarcoma was found by operation opposite the sixth, seventh, and eighth cervical segments. Enucleation of the growth resulted in an uneventful convalescence and complete recovery. The patient previously had been paraplegic.

J. J. Putnam and J. W. Elliott⁴ report 3 cases of tumor of the spinal cord treated by operation. They illustrate the benefit which may follow, and also the dangers with which such operations are attended. The first case had to do with a tumor in the cervical region, and is the first instance

¹ Berl. klin. Woch., July 4 and 11, 1904.

² Berl. klin. Woch., Jan. 25, 1904.

³ Ann. of Surg., June, 1904.

⁴ Jour. Nerv. and Ment. Dis., Nov., 1903.

in which an operation has been made for tumor at a level above the fourth cervical segment. The tumor was sarcomatous, and improvement seemed to be continuous without recurrence at the time of report. A second case, owing to the severe disintegration of the cord, was little improved aside from the relief of pain obtained by the operation. In the third case tumor in the lower cervical cord was found. The operation succeeded in removing the tumor, but was followed by rapidly fatal symptoms of obscure origin, not, however, unparalleled in cases of opening the spinal canal at this high level.

G. Woolsey¹ reports an interesting case of **tumor of the spinal cord**. The patient, a married woman of 34, in September, 1901, had a fall into a ditch, causing some bruising of the ankles and hips. On October 23 she noticed that jolting in cars caused pain in the left shoulder. This increased in severity and extended to the other shoulder, with pain in the back of the neck, in the area between the two shoulders. The pain became shooting and extended to the chest in knife-like radiations. In November, 1902, weakness of the left upper extremity was noticed at the piano, and a band-like sensation was felt in the abdomen. Soon after there was weakness in the left lower extremity. Later, sensation on the right side was impaired, and slight sphincter difficulties eventually developed. On examination, January, 1903, the patient complained of pain across the shoulders and back of the neck; had had shooting pains for a month; girdle sensation across the upper abdomen; tingling in hand, more in the left; difficult motion of left upper and lower extremities; most comfortable lying on the left side; contractions worse on the right side; left fingers and toes straighten out and draw up painfully on effort. The symptoms gradually increased, and on February 1, 1903, there was blunting of sensation on the ulnar side of the left forearm and the temperature-sense was disturbed on both sides of the trunk; the muscles of the left hand reacted sluggishly to faradism. Intravertebral tumor was diagnosed, its relation to the cord being subject to doubt. It was localized at the sixth cervical segment. Operation was done, and the spines of the fourth and seventh cervical vertebrae were removed and the dura found normal. Upon incision there was a troublesome flow of cerebrospinal fluid from the cranial side of the opening, which was checked by a small strip of gauze. On the left side and anteriorly the probe encountered resistance in the region of the sixth cervical laminae, and the cord bulged backward at this point, pressing it to the right, and a dark-bluish area was found in front of the posterior nerve-roots, two of which were cut. An encapsulated tumor continuous with the pia was removed. It was adherent to the inner surface of the dura and measured 2 cm. by 1.75 by 1.25. The patient made an uninterrupted recovery in practically all respects.

Arteriosclerosis of the Spinal Cord.—Collins and Zabriskie² report a case of spinal disease attributable to arteriosclerosis. The physiologic specimens are carefully studied and well described, indicating that arteriosclerosis may play the same rôle in the cord that it so commonly

¹ Med. News, Oct. 1, 1904.

² Med. Rec., Sept. 3, 1904.

does in the brain; that many of the so-called cases of myelitis are merely the result of narrowed or occluded arterial supply. The position long ago taken by Williamson and others has been confirmed by many, and no doubt will be generally held in the profession in a short time.

Changes of the Spinal Cord in Diabetes.—R. T. Williamson¹ presents the case of a man who had suffered from diabetes and whose cord showed certain degenerative changes in the columns of Goll, where was revealed a slight excess of neuroglia, especially in the cervical region, best seen in sections stained with anilin blue-black, according to Van Gieson's method. The nerve-fibers of these columns were mostly diminished in size. The myelin-sheaths and axis-cylinders were smaller than in Burdach's columns or other parts of the white fibers. Occasionally fibers with swollen axis-cylinders were seen, and a few with distended myelin-sheaths. In sections stained by Marchi's method degenerative fibers were seen in Goll's columns in the cervical, dorsal, and lumbar regions, but most numerous in the cervical region. There were also a few scattered degenerative fibers in Burdach's columns and in the intramedullary posterior nerve-roots. The degeneration of the posterior root-fibers was best seen in the lumbar cervical and lumbar regions. The posterior roots external to the spinal cord presented no degenerative fibers except in a few instances for a short distance outside the pia. The spinal changes here described are considered secondary, and due to the altered blood-condition in diabetes. At the point where the posterior root-fibers pass the pia-mater on the posterior surface of the cord they lose their myelin-sheaths for a short interval, and it is probable that at this point they are especially liable to suffer from the toxic substances in the blood. The changes in the intramedullary portion of the posterior root-fibers could be traced to this point in the case recorded. Similar changes in the intramedullary fibers of the posterior root can be detected in tabes. The knee-jerks and tendo-Achillis reflexes were absent in the case recorded. These signs are commonly attributed to change in the peripheral nerves, and this may be the explanation in many cases, but Williamson has found the peripheral nerves, in diabetes, of normal appearance when the knee-jerks were absent. It is possible that the loss of knee-jerks and heel-jerks may sometimes be due to changes in the intramedullary fibers of the posterior nerve-roots, as in the case in question.

Tuberculosis of the Spinal Cord.—C. L. Dana and J. R. Hunt² state that tuberculosis of the spinal cord occurs in 5 different ways: (1) As a part of a general disseminated tuberculosis; (2) as a part of tuberculous cerebrospinal meningitis; (3) as tuberculous tumor; (4) as a tuberculous softening or myelitis; (5) as extradural tuberculosis or tuberculous pachymeningitis with necrosis and edema of the spinal cord. The fourth form, tuberculous myelitis, is not generally recognized as a pathologic process, nor do the authors believe that they have furnished convincing proof of its existence, but they submit a number of suggestive and interesting cases that tend to support such contention.

¹ Brit. Med. Jour., Jan. 16, 1903.

² Med. News, Apr. 9, 1904.

Multiple Sclerosis.—J. R. Hunt¹ reports a case of multiple sclerosis with dementia. He divides the cases of multiple sclerosis in which there is a preponderance of mental symptoms into 2 varieties: (1) A group marked by extreme development of the sclerotic process in the gray matter of the brain. (2) A combined form, consisting of paralytic dementia and multiple sclerosis in combination. Both of these are rare. A case is reported with microscopic investigation. Hunt summarizes briefly: A clinical picture characterized by a progressive mental enfeeblement, manifesting during its course other symptoms of mental alienation, as mania, melancholia, hallucinations, and delusions, and accompanied by the somatic signs of multiple sclerosis, may be caused by the following pathologic changes: An extreme cerebral manifestation of the sclerotic process, of the same nature histologically as the disseminated plaques in the cord. A combination of two diseases, general paralysis of the insane and multiple sclerosis, in the same subject. The diffuse gliosis of the cortex with optic atrophy and degeneration of the posterior columns also arises for consideration in the differential diagnosis.

Hereditary Ataxia.—L. F. Barker² furnishes a description of the brains and spinal cords of two brothers dead of hereditary ataxia, being Cases XVIII and XX of a series in a family described by Sanger Brown. A brief review of the detailed and admirably illustrated condition is as follows: The brains and cords of both cases are relatively small. The cord, medulla, and pons in each case look smaller in proportion than the cerebellum. The cortex in both cases is well fissured. The cerebellum, although a little small in each case, is typical in macroscopic configuration. The cerebellar peduncles are all relatively small. The spinal cords look smaller than normal, and this is proved by actual measurement. Measurements made by Professor Donaldson show an abnormal ratio between the area of white matter and the area of gray matter in the cross-sections. Microscopic study in both cases reveals marked degeneration in the gray and white matter of the spinal cord, medulla, and cerebellum, the degeneration being more advanced in Case XVIII than in Case XX, a difference of degree rather than of kind. Degeneration involves in both cases chiefly nerve-cells and nerve-fibers of centripetal paths. In these structures the degeneration is extensive. In addition there is involvement of the dentate nucleus of the cerebellum, the brachium conjunctivum, and probably of the inferior olivary nucleus of the medulla. The more advanced case presents a possible diminution in part of the anterior horn cells and in the fibers of the anterior root. Corresponding to the degeneration in the white fibers of the cord there is an increase in glia tissue, more pronounced in the dorsal funiculus than in the lateral portion, corresponding to the cerebellar tract. Another case from this family has been previously studied by Adolf Meyer (Brain, 1897), who made out a marked diminution in the number of cells in Clarke's nucleus, a degeneration of the direct cerebellar tract and of the posterior funiculus, especially in the cervical region. In general the lesions of the 3 cases are

¹ Am. Jour. Med. Sci., Dec., 1903.

² Decennial Pub. of the Univ. of Chicago, 1903

nearly identical as regards the neurons involved, with differences in the extent of the process in accordance with the differences in clinical symptoms. Barker looks upon the degeneration in the posterior portion of the cord as systemic—that is, involving only certain of the fibers and collaterals of the intramedullary continuation of the posterior roots. Meyer's studies and those of Barker show that in this family the dorso-lateral cerebellar tract is the one which degenerates.

Progressive Muscular Atrophy.—Sanger Brown¹ calls attention to the treatment of progressive muscular atrophy, both the spinal and the muscular type, by the hypodermatic administration of strychnin nitrate, first strongly recommended by Gowers. He reports a number of cases which were benefited, and some in which it apparently was of no value. He says that while the treatment has fallen short of his expectation, it has in a sensible degree dissipated the horrible sense of despair which the prognostic contemplation of these cases formerly aroused in him. The value of hygienic measures and the judicious use of electricity, massage, and gymnastics are of perhaps equal importance, and enhanced when used in conjunction with the strychnin treatment advocated.

DISEASES OF CEREBRAL MENINGES AND CRANIAL NERVES.

Trifacial Neuralgia.—Chas. H. Frazier,² in a clinical lecture on the symptomatology and treatment of trifacial neuralgia, principally with reference to operation, says in conclusion: 1. To sum up in a few words the treatment of trifacial neuralgia I would say that in all incipient cases remove the predisposing cause and administer strychnin hypodermatically in heroic doses under proper precautions, and with such adjuvants as have been suggested. 2. In cases that do not respond to this mode of treatment, in which the pain is referred to but one branch, recommend the peripheral operation, even though the operation may have to be repeated. It will afford relief at least temporarily, in every case, and in some cases permanently. 3. When the peripheral operation has failed to afford but temporary relief, even though it may have been properly executed and repeatedly performed, or when from the onset the pain is referred to two or more branches, recourse should at once be had to an intracranial operation: either division of the sensory root or, in certain selected cases, division of the second and third divisions, with interposition of a foreign substance to prevent reunion.

H. M. Sherman³ reports a case of intracranial neurectomy for trigeminal neuralgia. This case, if it has been properly observed, is important in the recurrence of pain after section of the sensory root by the method advocated by Frazier. Supposedly this operation was done in this instance, but sensation returned after a time in the distribution of the nerve below Gasser's ganglion. A second operation was done to remove the ganglion, with better results. In the same issue of the same journal Frazier and Spiller report further upon their so-called physiologic ex-

¹ Med. Rec., Aug. 6, 1904.

² Am. Jour. Med. Sci., Dec., 1903.

³ Jour. Am. Med. Assoc., Oct. 1, 1904.

tirpation of the ganglion,—namely, the section of the sensory root,—and assert that experimentation upon animals, as well as operation on the human subject, confirms their contentions that there is no possibility of regeneration and recurrence of sensation below the point of incision because of the ascending degeneration of the severed root. The term physiologic extirpation of the ganglion goes back to a paper by van Gehuchten, who believes that it is fully as radical as extirpation of the ganglion itself, over which it has decided advantages, though presenting certain technical difficulties in the operation. This operation has now been carried out by Frazier on 4 patients, with very satisfactory results.

J. B. Murphy¹ reports his experience in trifacial neuralgia treated by the injection of osmic acid into the various nerves. His paper is epitomized in the following conclusions: 1. That trifacial neuralgia (tic douloureux) is not the result of a pathologic entity which has so far been definitely determined. 2. The tendency after all types of operation, with the possible exception of removal of the sensory root behind the ganglion, is to recurrence of the disease. 3. This is probably due to the regeneration of certain nerve-elements following the deep operation, and anastomosis and retention following the superficial. 4. Sudden shocks and irritation to the terminal filaments of the trifacial not infrequently cause an immediate and occasionally a permanent cessation of the neuralgic pain. 5. The mortality from the superficial exsections is practically *nil*; the mortality from the intracranial operations is great. The hazard is greater than should be taken in a disease which does not in itself jeopardize life. 6. Injections of osmic acid in 1 % to 2 % solution into the nerve-trunks relieve the pain immediately, and in a large percentage of cases for a long period of time. 7. The injections into the superficial tissue for peripheral neuralgia should be abandoned, as the nerve-trunks are easily located, and there is no danger of superficial necrosis following such operation. 8. It should never be injected into a motor nerve or a motor nerve-area, and, therefore, never into the spinal nerves except in amputation-stumps. 9. It produces a local necrosis of the tissue into which it is injected, and even of the wall of the foramen. This necrosis does not suppurate unless the area is exposed to mouth-infection. In that case the suppuration often continues for weeks, draining into the mouth, giving no special inconvenience, and in no way interfering with the final result. 10. The best results are obtained with a 1.5 % to 2 % solution; this should be injected in many places into the nerve-trunk and also into the foramen. 11. All the nerve-branches should be injected—the palatine, lingual, mandibular, superior maxillary (infraorbital), and supraorbital. They can all be exposed through mouth-incisions, except the supraorbital. Many times there are 3 or 4 divisions of the supraorbital, and they should be searched for carefully and each injected. Occasionally it is necessary to inject the auricular branch. The posterior palatine is not so difficult to inject as one would at first imagine. 12. The foramina can and may be injected without anesthesia

¹ Jour. Am. Med. Assoc., Oct. 1-8, 1904.

or incision. The procedure is quite painful, however, and is not certain in its results. 13. The injections can be made with local or general anesthesia. I prefer the general. 14. The injection is free from danger. 15. Judging theoretically from the experience with incisions, resections, and ganglion operations, the relief *should not be permanent after the injection of the osmic acid*. From clinical experience up to date, however, and particularly from Mr. Bennett's showing, the fact is that many cases are permanently cured. Time alone must determine the final result of this treatment. Its ease of application, its *nil* mortality, and its immediate results forcefully commend its use.

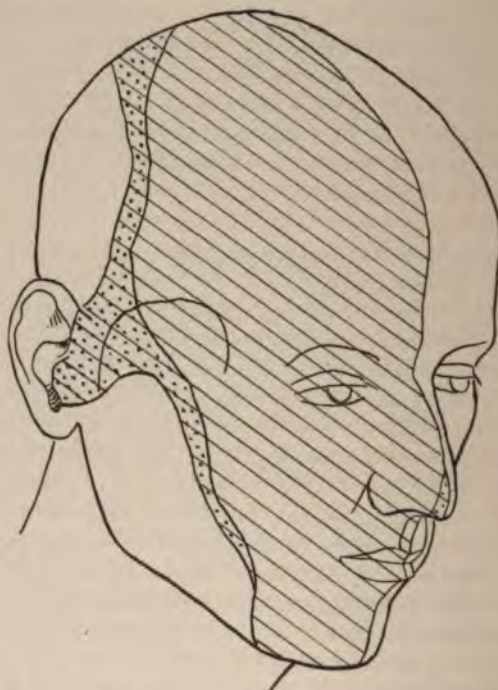


Fig. 2.—Diagram showing the normal (average) field of postoperative cutaneous anesthesia. The shaded area, including tragus and anterior wall of meatus, remains anesthetic to tactus (hair esthesiometer) stimuli. The dotted strip gives the impression of touch or pressure to pain stimuli (needle), with few if any actual pain points (Cushing, in Bull. Johns Hopkins Hosp. July-Aug., 1904).

H. Cushing¹ contributes a very admirable article, embracing a study of the sensory distribution of the fifth cranial nerve, based upon an examination of 26 cases in which extirpation of the ganglion had been done. He says: Particular attention has been paid in these cases of trigeminal neurectomy to the delineation of the *field of post-operative tactual anesthesia*, inasmuch as points of chief interest have been obtained therefrom, and the outline thus plotted seemingly represents the extent of anatomic distribution of the terminals of the nerve. This boundary-

¹ Bull. Johns Hopkins Hosp., July-Aug., 1904.

line may be traced as follows: Starting from the midlongitudinal line of the scalp at a point which roughly corresponds with the upper end of the underlying rolandic fissure, the line crosses the scalp with some irregularities, but generally in a forward and downward direction, much as does this underlying cerebral fissure; it then drops to the anterior attachment of the pinna, around the edge of which it curves in a backward direction, so as to include a small section of the ascending rim of the helix, together with the entire crus of the same; thence it disappears in the external auditory canal at the upper edge of the meatus; from this point the line passes into the canal along its upper wall as far as the tympanic membrane, which is included to a greater or less extent in the anesthetic area, returns along the lower and anterior wall of the canal to the lower edge of the tragus, where it once more reappears on the exposed cutaneous surface; thence it passes at a greater or less angle in a forward and slightly upward direction across the zygomatic region for a distance of from 3 cm. to 5 cm., before turning and sweeping downward across the cheek, still keeping nearly 5 cm. from the posterior edge of the ascending maxillary ramus (about half-way between the angle of the jaw and corner of the mouth), until it drops under the edge of the horizontal ramus and regains the midline 1 cm. to 2 cm. below the mental prominence. The median boundary of the anesthetic area, determined by tactile stimuli (horsehair test), correspond in all cases exactly with the midline of the crown, forehead, nose, lips, and chin. There is detectable, however, as in the case of the posterior boundary, a very narrow border strip, broadening out slightly at the root and tip of the nose, in which painful stimuli are interpreted, as touch or pressure; analgesia as such, however, reaches, as does tactile anesthesia, to the midline. (See Figs. 2, 3.)

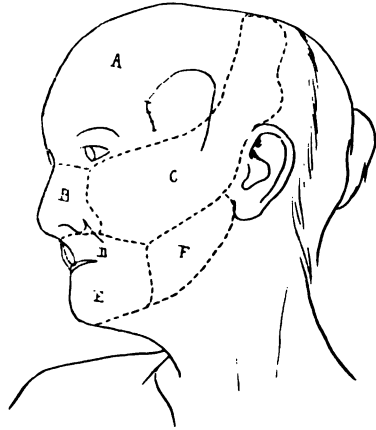


Fig. 3.—Krause's "Beobachtung 3." Showing the results of an examination 4 weeks after a ganglion extirpation (Cushing, in Bull. Johns Hopkins Hosp., July-Aug., 1904).

Outline of the Mucous-membrane Field.—The boundary of the intra-buccal field of anesthesia may be traced, as has been the skin-field, by beginning at a given point, and for this purpose the mucocutaneous junction of the lower lip may be conveniently chosen. The line of anesthesia (Fig. 4) to all forms of sensation corresponds exactly with the midline of lip, frænum linguæ, tip and dorsum of tongue as far back as a point slightly anterior to the foramen cæcum; thence it passes outward along the row of circumvallate papillas to the lateral root of the tongue, where there is some variation from case to case, though in the majority of instances it passes along the palatoglossal fold, to the upper portion of the anterior pillar of the fauces (arcus glossopalatinus), which it follows to the

uvula. The posterior pillar (arcus pharyngopalatinus), so far as I have observed, together with the tonsil and the lower or vertical portion of the anterior pillar, retain their sensation, and developed as they are from the parts posterior to the mandibular arch, are supplied, as would be expected, by the glossopharyngeal nerve. With the exception of the tongue, as will be described, the entire mucous field within these lines is rendered completely devoid of sensation by the neurectomy: the lips, teeth, gums

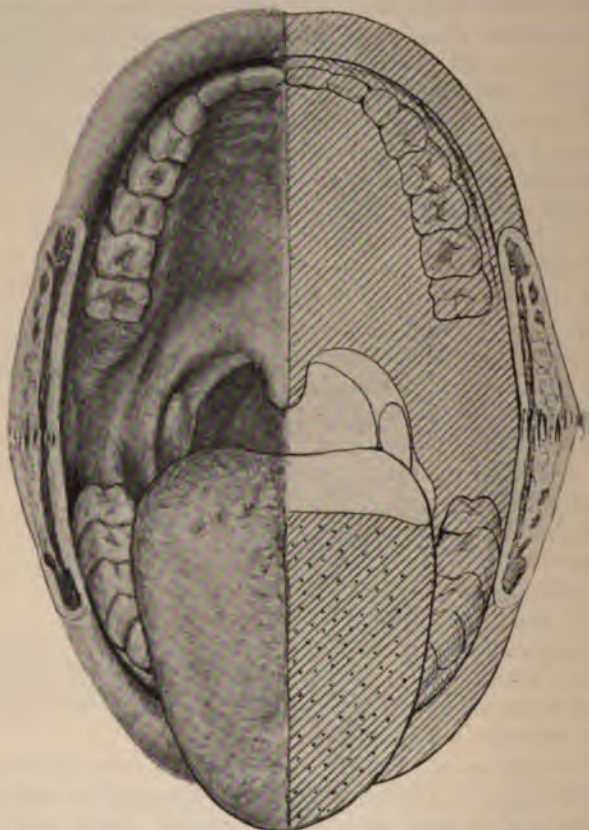


Fig. 4.—Diagram of intrabuccal anesthesia. Other mucous surfaces, the Schneiderian membrane, dorsum of palate, root of pharynx, and half of Eustachian orifice (?) are also without sensitivity (Cushing, in Bull. Johns Hopkins Hosp., July-Aug., 1904).

anterior two-thirds of the tongue, cheek, hard and soft palate, uvula, a portion of the pharyngeal vault, together with the entire Schneiderian membrane on one side. Instruments may be introduced into and through the nasal chamber, the patient being unconscious of their presence. The sneezing reflex is abolished, as well as the gagging reflex produced by irritating the soft palate on the side of anesthesia. The fumes from ammonia, ether, and like substances are no longer irritating when inhaled, the irritant quality acting apparently upon the nerves of common sen-

sation alone and not upon those of special sense, for the latter remain unaffected. After a trigeminal neurectomy that portion of the tongue anterior to the circumvallate papillae is an exception to the rule of total anesthesia to all forms of stimuli. Simple tactual impulses produced with a horse-hair, as well as those of pain and temperature, are completely interrupted exactly to the midline. Certain forms of common sensation are, however, preserved. If a cotton swab or a wisp of cloth be moved over the anesthetic field, its presence is recognized, localized more or less accurately, and its direction of movement appreciated. There are reasons for believing that certain fibers from this area of the tongue, not only special sense fibers of taste, but also of common sensation, pass to the brain by way of the chorda tympani and the nervus intermedius (Wrisberg).

Neurofibroma of the Acoustic Nerve.—Fraenkel and Hunt¹ furnish a contribution to the surgery of neurofibroma of the acoustic nerve, with remarks on the surgical procedure by Woolsey and Elberg. They insist that the recognition of such a tumor is possible, and arrange the symptoms as follows: 1. General: Headache, vertigo, vomiting, optic neuritis, bradycardia. 2. Focal: Peduncular ataxia, cerebellar ataxia, lateropulsion, hemiasynergy, homolateral and crossed paralyzes of the extremities, paralysis of the basilar cranial nerves, especially the seventh, sixth, and fifth, dysarthria, dysphagia, nystagmus, paralysis of the conjoint movements of the eyes, inequality of the pupils, and attacks of Adams-Stokes' syndrome. 3. Special: Serious impairment of the function of the auditory nerve, of long standing and gradual onset. Details of 2 cases are then given, and the necropsy conditions are presented. Their general conclusions are: 1. We believe that the acoustic tumor syndrome is well defined, and that the diagnosis can be made with practical certainty. This presupposes not only the diagnosis of the location of the tumor, but its nature and comparative size. It must, however, be observed that other slowly growing pathologic conditions in the posterior fossa might simulate closely this condition. 2. The slow and essentially benign nature of the growth, its noninfiltrating character and enucleability, would all favor surgical interference. 3. The deep situation at the base in immediate proximity to vital centers offers very serious obstacles. 4. From personal observation we believe that the surgical technic should be perfected along the following lines: (a) The avoidance of undue concussion in the removal of the bone and enlargement of trephine opening. (b) A method of extirpation by which the tumor could be extirpated without undue manipulation of the surrounding parts. (c) The division into stages, as recommended by Horsley, and celerity of execution. (5) The study of the literature of this subject is unsatisfactory because most of the cases are recorded under the heading of cerebellar tumors. We succeeded in collecting from the literature 6 other cases which presented the clinical and pathologic characteristics of the acoustic neuroma. An abstract of these cases is appended.

Tuberculous Meningitis.—Avanzino² publishes the history of a boy

¹ Ann. of Surg., Sept., 1904.

² Riforma Medica, Aug. 20, 1903.

aged 14, presenting a history of 12 days' illness beginning with malaise, wandering pains, headache, constipation, and fever. On admission he showed a temperature of 100°, pulse of 90, respirations 28, abdomen tympanitic, spleen enlarged, no respiratory or cardiac disease. On the seventeenth day of the disease there were opisthotonos, photophobia, and intense headache; temperature showed large morning remissions and evening elevation; pulse dropped to 74. On the twenty-second day there were oliguria, obstinate constipation, repeated vomiting, strabismus. The patient was almost unconscious, and at the least touch uttered a characteristic hydrocephalic cry. The abdomen became contracted and there was wasting. Double optic neuritis and Kernig's sign were present. On the twenty-sixth day lumbar puncture was done, and 30 cm. of fluid were withdrawn on strong pressure; this was turbid, had a specific gravity of 1012, contained traces of albumin, no microorganisms, and numerous leukocytes; cultures negative, but injections into a guinea-pig caused tubercle in the animal. After puncture the boy improved slowly, and finally left the hospital, apparently well, in a couple of months, and has remained well. The optic neuritis gradually cleared up. There was no paralysis throughout. No family history of tubercle. Avanzino believes this was a case of true tubercular meningitis with recovery.

G. W. Squires¹ says that he has invariably found in basilar meningitis as early as the fourth or fifth day a **rhythmic dilation and contraction of the pupil**. He places the child's head between the physician's knees with the face upward, the body being supported on the bed, table, or lap of the nurse. He grasps the sides of the child's head with each hand, and produces complete extension of the head on the spinal column. As the head is bent back the pupils will be seen to commence to dilate simultaneously with the extension, and the more extreme the extension, the more the dilation. Upon flexion the pupils contract so that when the head is brought well to the sternum, the pupils are closed. This may be repeated several times in a minute and each time the pupillary response occurs.

Tuberculosis of the Nervous System.—E. F. Trevelyan² takes up the subject of the infection of the nervous system through tuberculosis. His remarks are based upon the records of 114 fatal cases which have occurred during the past 20 years in the Leeds General Infirmary. The various forms of tuberculosis of the nervous system consist of tuberculosis of the dura mater, tuberculous meningitis in its more general and limited forms, tuberculous masses in the brain and spinal cord, and possible miliary tuberculosis of the brain itself. The old question, raised many years ago, as to whether it is possible to have a tuberculous meningitis without tubercles, may be answered positively, inasmuch as 14 of the Leeds cases presented thickening and exudation at the base of the brain, without visible tubercles. Cerebral symptoms were present before death in 12 of these cases, and abundant tuberculous lesions present in all. It is probable that tuberculous formation was at a minimum, and the changes noted were a manifestation of the tuberculous infection and were respon-

¹ Med. Rec., Mar. 26, 1904.

² Brit. Med. Jour., Nov. 7, 1903

sible for the symptoms. The limited meningitis described by French authorities consists of a great thickening, with tubercle formation over a limited portion. There were 9 cases in the series, in which such localized thickening of the cortex was noted. Tuberculous masses in the brain are present in 33 of the 114 cases. In 15 they appeared to be recent, in 17 they were multiple. The largest number present in one case was 4. In size they varied from that of a millet-seed to that of an orange. They vary in consistence, and when laid open, display a yellowish and caseating center and a peripheral zone made up of recent tuberculous tissue. Tubercle bacilli may or may not be found in this zone. As a rule, these masses show little tendency to break down except in the pons, medulla, and cord, where they are surrounded by nervous tissue, and they most often project to the surface. Infection of the cerebrospinal fluid is thus easily brought about. In 23 of the 33 cases there was also present a tuberculous meningitis. Tuberculous tumors of the spinal cord are not common. The relatively rare tuberculous tumors of the dura mater are nearly invariably multiple, and grow from its inner vascular surface in the posterior fossa or from the falx cerebelli. It is admitted that a complete examination nearly always reveals an older focus somewhere. In only 6 cases was no such focus found, and in this the examination was incomplete. A direct infection through the nose is believed to be possible, and a spread from tuberculous disease of the ear may take place, though the ear is usually infected originally through the lymphoid tissue of the nasopharynx. Grimmer, for instance, puts down tuberculosis as a cause of middle-ear disease in 65 % to 70 % in children under 5, and 16 % above that age. Of the 114 cases, 10 had obvious ear-disease. In spinal cases Trevelyan takes it that general tuberculous meningitis is not of common occurrence. There were 4 such cases in the series of 114, but the notes were again incomplete. The lungs were normal in 28 cases. It has, however, been proved that tubercle bacilli may pass through the lungs without leaving an obvious recognizable lesion. Miliary tuberculosis of the lung was noted in 54 cases; 18 presented phthisis, with miliary lesion in 8. Phthisis is said to be the most common cause of tuberculosis in the adult. The bones and joints were affected in 23 out of the 114 cases. The bones affected were the spinal column in 4, and the frontal bone and ribs each in 1. In 4 cases the kidney was the seat of extreme tuberculous disease. Ordinary tuberculous peritonitis was noted in 8 cases, and intestinal ulceration in 28. In another there was extensive tuberculosis of the colon and rectum. The records are incomplete regarding the relation of the lymphatic glands to tuberculous meningitis. It is thought that those which stand in most direct relation to tuberculous meningitis are the mediastinal. Haushalter and Fröhingsholze have found old and caseating lesions in the retrobronchial glands in 63 out of 67 cases of tuberculous meningitis. It is a striking fact that in as many as 40 cases no old focus other than the adenopathy was present. This close relationship must be connected with the important fact that the lungs constitute the port of entry of the tubercle bacillus in the majority of these cases. A puzzling question connected with the infecting focus is the

mobilization of the tubercle bacillus from it. It has been suggested that tuberculin may bring about this effect, as, for instance, a case reported by Rutimeyer. Tuberculous meningitis occurred shortly after operation in 8 out of the 114 cases. Some have thought that tubercle bacilli might be liberated in the site of operation, and thus gain access to the blood-current. Trevelyan believes that the deep inspirations caused by the anesthetic may bring about an inhalation-infection of hitherto sound parts of the lungs. It has also been suggested that mechanic concussion may lead to the escape of bacilli from the infected focus. The route by which the bacilli travel from the infecting focus to the meninges or brain has not been satisfactorily worked out. It is by either the blood or the lymphatic vessels. A striking fact in connection with tubercular meningitis is the marked alteration in the bloodvessels. Cornil and others have studied the changes in the brain after injecting tubercle bacilli into the carotid artery of rabbits. No bacilli were found in the arterioles, but they were found in the perivascular sheaths, which were filled with large, swollen cells, illustrating the development of the tubercle at the expense of the lymphatic sheath. But Sicard insists that it is impossible to infect the meninges through the lymphatic system. These changes make it almost certain, together with experimental evidence, that the tubercle bacilli arrive through the blood-stream. It is curious that the lesions of ordinary tuberculous meningitis usually focus themselves about the middle cerebral artery and its branches, whereas tuberculous tumors are more commonly found in the distribution of the basilar and posterior cerebral arteries.

The most important contribution to the diagnostic resources consists in the examination of the cerebrospinal fluid by Quinke's spinal puncture. In none of 5 cases were the tubercle bacilli found in the deposit. In 4 of the 5 cases lymphocytes alone were found, and in 1 only polymorphonuclear cells. The inoculation test gave a satisfactory result in 3 out of 4 cases in which it was tried, and was incomplete in the fourth. The point of importance in the examination of the spinal fluid is the presence of lymphocytes and tubercle bacilli in the deposit, and the results of the inoculation test. The finding of the tubercle bacilli in the deposit is by far the best clinical test, as it requires but little time and has given positive results in the hands of various observers up to one-half and three-quarters of the cases. Trevelyan looks upon his own want of success as an accident. The inoculation test is valuable, but has the disadvantage of delay. In reference to recovery Trevelyan gives notes of 2 cases in children treated in the infirmary, in which it was supposed there was tuberculosis of the brain. In considering recovery from tuberculous meningitis, distinction must be drawn between the ordinary generalized form and the limited *meningitis en plaque*, for which operation may be strongly recommended. Bacteriologic proof of the nature of meningitis has been provided in cases of recovery recorded by Freyhan, Henkel, Barth, Gross, Winter, and Gohl, tubercle bacilli being found in the spinal fluid in all these instances. Recovery of these cases is not to be attributed to any particular line of treatment. In spite of such recoveries the

prognosis must be looked upon, at least for practical purposes, as hopeless.

Cerebrospinal Meningitis.—M. Manges¹ reports upon the treatment of cerebrospinal meningitis by the intraspinal injection of lysol solution, and details 3 cases. The suggestion arose from the experience of Seager in a series of cases treated during the epidemic in Lisbon, and reported in the London Lancet of Nov. 1, 1902. This treatment consists of lumbar puncture and the withdrawal, by aspiration, of varying quantities of cerebrospinal fluid from the spinal canal, frequently amounting to 50 cc. "Artificial serum is then injected with the same syringe, the needle being left *in situ*, and the surrounding parts are washed with serum; lastly, a quantity (from 9 cc. to 12 cc.) of a 1 % solution of lysol is injected through the same instrument, and the needle withdrawn. The temperature falls immediately, but rises again after 1 to 3 days, when the puncture and injections are repeated, and so on until only quite clear and limpid fluid is withdrawn after puncture, when the injection of lysol is stopped. Afterward a few punctures are made to see if the fluid continues clear." Seager calls attention to the painfulness of the treatment, which, however, Manges' experience in the 3 cases treated does not corroborate. Of the 31 cases in Lisbon which were treated with lysol, 13 died—5 from dilatation of the cerebral ventricles, 2 from pulmonary tuberculosis, 1 from edema of the glottis, 1 from purulent pneumonia, and 4 from the disease without complications. The 18 that recovered were *completely* cured. Of the 3 cases reported by Manges, the first was a meningococcus infection, the second a virulent streptococcus. All 3 patients recovered.

C. E. Nammack² reports upon the treatment of 27 cases of cerebrospinal meningitis admitted to Bellevue Hospital during the epidemic of 1903-04. Twenty-four died—a mortality of 90 %. Seager's treatment, as published in the London Lancet of November, 1902, was used. Nammack's experience with lysol treatment embraces 5 cases, 4 of which died.

Facial Atrophy.—B. T. Burley³ reports, with photographic illustrations, several cases of facial atrophy in which the deformity was treated by subcutaneous injections of paraffin, producing a decided cosmetic improvement.

Peripheral Neuritis of the Hypoglossal Nerve.—A. Panski⁴ reports a very interesting case of peripheral neuritis of the hypoglossal nerve attended by atrophy of the corresponding side of the tongue. He calls attention to the fact in 79 cases of hemiatrophy of the tongue collected by Ascoli, in only 28 of them was it due to the peripheral lesion of the hypoglossal nerve, in the other instances the hemiatrophy being a symptom of central brain-disease or a combination of brain- and cord-disease. Since the publication of Ascoli, others have appeared, so that now there are 40 observations of isolated paralysis of the hypoglossal. In Panski's case the paralysis of the tongue came on suddenly within 10 weeks. It apparently was a neuritis secondary to an inflammation on the side of the throat.

¹ Med. News, May 14, 1904.

² Boston M. and S. Jour., Apr. 14, 1904.

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³ Med. Rec., June 4, 1904.

⁴ Neurolog. Cent., Aug., 1903.

Hemianopic Hallucinations.—A. Pick¹ calls attention to the appearance of hallucinations in the visual field related to the blind half of the retina, and reports 4 cases in which this subjective phenomenon was present. He thinks there is no indication of a localized basilar process as a necessary essential to the development of this peculiarity, and that there remains nothing but the assumption of a functional disturbance similar to migraine. He calls attention to the transition of scotoma scintillations and elementary light phenomena into real hallucinations forming the field. Hemianopic hallucinations may be produced by a variety of localized excitations in the optic tracts, but not necessarily the occipital lobe. The force of his contention would be much strengthened had his cases been examined postmortem.

Facial Palsy.—A. S. Taylor and L. P. Clark² report their experience in the surgical treatment of facial palsy, and give the technic of facio-hypoglossal nerve anastomosis. This or similar operation is indicated in all cases of palsy of the facial nerve due to lesion of the nucleus or the nerve-trunk on the base of the brain, and lesions of the nerve following operations for mastoid disease. It is proper in facial palsy presenting complete reaction of degeneration after several months of faithful treatment with no indication of volitional return of nerve-power. The authors report a number of cases, the results of which, however, were not highly satisfactory. The technic of the operation, which they deem preferable to that of anastomosis with the spinal accessory, is given at length and well shown by illustrations and diagrams. They carefully advise against complete section of the hypoglossal nerve. The difficulties of mastication, swallowing, phonation, etc., present in the first few weeks after operation prove that complete division of the nerve would be a serious drawback to the comfort and happiness of the patient. The actual value of the operation can be determined only by time and a large number of cases.

G. W. Jacoby³ presents his experience with **the sign of the orbicularis** in paralysis of the seventh cranial nerve. The symptom consists in inability of the hemiplegic voluntarily to close the eye upon the paralyzed side except in conjunction with the other eye. Jacoby concludes: 1. The statement of Bard, that the sign is invariably lacking in peripheral facial paralysis, and is, therefore, a distinguishing mark of central affection, is incorrect. 2. The presence of the sign in peripheral paralysis is further proof of the existence of commissural fibers between the nuclei of the seventh nerves. 3. The sign is of clinical value so far as its presence in peripheral paralysis shows that complete recovery has not yet occurred. 4. The secondary overaction in the orbicularis palpebrarum, which is late in appearance and always coincides with some recovery in power, does not occur in those cases in which the sign, having been present, has passed away.

¹ Am. Jour. Med. Sci., Jan., 1904.

² Med. Rec., Feb. 27, 1904.

³ Jour. Nerv. and Ment. Dis., Oct., 1903.

DISEASES OF THE BRAIN.

Central Neurofibromatosis.—J. Fraenkel and J. R. Hunt¹ report 4 cases showing tumors of the pontomedullocerebellar space. The occurrence of neuromas upon the cranial nerves is identical with those of generalized neurofibromatosis, and frequently the 2 conditions are found associated. This group of tumors shows the symptoms common to new-growths in the posterior fossa of the skull. The essential distinguishing feature separating them from intracerebral or cerebellar tumors is the early appearance of symptoms referable to single nerves. The nerves most frequently affected are the eighth and the fifth; hence tinnitus aurium with progressive loss of hearing, Ménière's syndrome, on the one hand, and obstinate and atypic attacks of neuralgia, on the other, are of diagnostic importance. Owing to histologic peculiarities, the conductivity of the vibrations of the nerves involved is not always accomplished. The 4 cases reported showed a common origin of the tumors from cranial nerve-trunks, their pathologic structure being a neurofibromatosis in pure form or in various stages of change and transformation. The locality was practically the same, namely, the angle formed by the junction of the pons, medulla, and cerebellum. The symptomatology was analogous in all 4 cases. The certainty of localization, the essentially benign nature of the growths, their loose attachment to the meninges and nerve-trunks distinguish this group of intracranial tumors as a favorable one for operative interference, and the authors think such cases should be assigned to a separate place in the group of intracranial tumors.

Hemiplegia.—J. S. Bury² calls critical attention to the **difference of the respiratory expansion on the two sides** in hemiplegics. In 60 % of the cases examined during recent years the movement of the upper part of the thoracic cage during ordinary breathing was a little greater on the hemiplegic than on the other side of the body, as was demonstrated by tracings which were made with a specially prepared apparatus. Upon forced respiration the sound side shows a greater excursion.

L. P. Clark³ presents a study of the movements of the superior intercostal muscles in hemiplegics. He calls attention to the statement that the two sides of the thorax move equally in the respiratory movements of the hemiplegic, then quotes Hughlings Jackson, who states that the superior intercostals are more or less involved. Examination of a number of hemiplegics in regard to this question showed that they were invariably involved in 161 cases, uniformly, without apparent relation to age, duration, or severity of the capsular lesion. There was observed a double change, as overaction on the paralyzed side and automatic respiration; a lessened activity on the paralyzed side and extraordinary or volitional respiration. In all cases the symptom can be detected by palpation, and in most cases even by inspection. He explains the phenomenon as follows: In destructive lesions of the internal capsule causing paralysis, hemiplegic in character, the cortical inhibitory control over the med-

¹ Med. Rec., Dec. 26, 1903.² Lancet, Dec. 19, 1903.³ Am. Jour. Med. Sci., Dec., 1903.

ullary respiratory center of the paralyzed side is destroyed in greater part, at least, much more on the hemiplegic side than is that center presiding over the sound side; in consequence of this withdrawal the uninhibited medullary center overacts in automatic or ordinary respiration, hence the excess movements on the paralyzed side. But in forced conscious or volitional (cerebral) respiration the movements of the thorax on the opposite sound, or nearly so, side are greater.

Loeper and Crouzon¹ present a number of illustrations of cases of hemiplegia showing decided edema. They believe that the **edema** of the hemiplegic is frequently of mixed origin; that a hemiplegia incapable by itself of producing edema brings forward some disturbance of filtration and the physiologic changes in the interstitial spaces. This mixed edema is interesting, as it ordinarily points to and is dependent upon a renal or cardiac lesion which up to that time may have been latent.

W. Browning,² under the title of apoplectic motation, calls attention to the value of **restlessness in apoplectic conditions** as indicating cerebral hemorrhage rather than embolus or thrombosis. This restlessness or motation continues from the onset of the disorder until profound coma has produced relaxation, and consists in movements of the head, limbs, and trunk. A number of cases are cited to substantiate the claim, but as many of them lack positive proof of being hemorrhage, and others quoted as thrombosis are not confirmed by autopsy, the value of the sign is not proved. It is, however, worthy of attention and further investigation.

H. Steinert³ calls attention to an **atrophy** that occurs in the portions of the body paralyzed as the result of cerebral lesions. A matter of particular interest are the changes in the skin on the paralyzed side, points which are very generally overlooked in the text-books. He calls attention to the fact that Nothnagel speaks of the thickening of the skin upon the paralyzed side; Kornilow, the hypertrophy of the fatty layers of the skin often attended by an increase in the growth of nails and hair. Steinert's case shows a diminution in the hairy growth on the affected extremities, which he believes has not before been reported and which is sometimes present in cases of very slight severity.

Brain-tumor.—W. Browning⁴ contributes an article entitled "A Method for the **Relief of Pain in Tumors of the Brain.**" His method consists in the administration of such depressants as aconitin, veratrum, or gelsemium in such doses as to control the pulse and thereby relieve the intracranial pressure. The remedy can be continued as required, though the condition of the circulation should be frequently observed and the amount of the drug regulated according to the necessity of the case and the way it is borne. The amount of the drug should be kept below the danger-line as indicated by the pulse, on the one hand, and the control of the pain, on the other.

W. G. Taylor⁵ reports an interesting case of endothelioma of the dura

¹ *Nouv. Icon. de la Salpet.*, May-June, 1904. ² *Brooklyn Med. Jour.*, Oct., 1904.

³ *Deut. Zeit. f. Nervenheilk.*, July, 1903.

⁴ *Jour. Nerv. and Ment. Dis.*, Nov., 1903.

⁵ *Am. Jour. Med. Sci.*, Feb., 1904.

operated upon successfully with apparent recovery, but death occurred in 108 days from a recurrence of the growth. William G. Spiller, in the same journal, reports 5 cases of tumor of the brain with operation, and Charles H. Frazier discusses the surgery of tumors of the brain, with a résumé of operative records of 4 craniotomies.

George Woolsey¹ presents a paper upon cerebral tumors, and reaches the following conclusions: 1. The sphere of operation for cerebral tumors may be and has been extended to those parts of the cortex where tumors are accessible and localizable—*i. e.*, to the prefrontal, parietal, and occipital regions, in addition to the motor area. 2. The prognosis, both immediate and remote, is as good as or even better than in operation for malignant growths in some other locations. 3. This prognosis has improved with the improvement in localization and operative technic, and with the limitation of radical operations to cases accurately localized. 4. The palliative operation is strongly indicated to relieve symptoms where localization cannot be accurately made or the tumor cannot be removed. The exploratory operation is contraindicated. 5. Practically all circumscribed growths of moderate size are suitable for operation. 6. The osteoplastic method should be employed, and the most rapid and perfect technic adopted which the circumstances allow.

O. G. T. Kiliani² makes some remarks on **tumors of the chiasm**, with the proposal of reaching them by operation. He details a number of cases due to tumors of the chiasm, and then details a plan for operation. This has been carried out satisfactorily a number of times on the cadaver, but not on the living subject. A Wagner flap is made on the frontal bones with true omega shape, the base about a half-inch behind the coronal suture, the indentation of the omega lying exactly in the median line, so as to avoid opening the frontal sinus. The dimensions of the flap are 5 inches in the median line, the lateral diameters being $5\frac{1}{2}$ inches, the width 7 inches, and the base, where broken off, $3\frac{1}{2}$ inches. The skin-incision severs the temporal artery on both sides.

W. M. Leszynski³ reports a case of brain-tumor involving the right lateral ventricle in which a röntgen-ray picture gave a shadow corresponding to the location and size of the tumor.

R. T. Williamson⁴ calls attention to the diagnostic value of **hemiplegia of gradual onset as a sign** of cerebral tumor. It has long been recognized that hemiplegia attended by other symptoms of brain-tumor is not uncommon, but Williamson presents a case in which the usual symptoms of brain-tumor were not present, and yet, by the gradually increasing hemiplegia, a diagnosis of brain-tumor was made which was abundantly confirmed. He emphasizes the value of hemiplegia of gradual onset as a sign of brain-tumor even in the absence of optic neuritis, or when optic neuritis, headache, and vomiting are all absent. In other words, provided there are no indications of cerebral abscess, progressive hemiplegia in which weeks or months elapse before the paralysis is complete may be regarded as strong evidence of cerebral tumor.

¹ Am. Jour. Med. Sci., Dec., 1903.

³ Med. Rec., Jan. 30, 1904.

² Ann. of Surg., July, 1904.

⁴ Practitioner, Sept., 1904.

Burr and Pfahler¹ report a very interesting case of thrombosis of the midcerebellar artery causing aphasia and hemiplegia, in which examination of the brain by the röntgen-ray showed a distinct shadow at the location subsequently found to be the seat of thrombotic softening. The case was a woman of 67 admitted to the hospital with right-sided hemiplegia and presenting aphasia. After death the brain was found to be diseased as indicated, and upon being replaced in the skull, was submitted to röntgen-ray examination. It is regrettable that the examination did not precede death, although it shows rather conclusively that in the dead subject, at least, large areas of softening are capable of leaving definite traces upon the plate.

Disease of the Corpus Callosum Caused by Alcoholism.—Marchiafava and Bignami² describe 3 cases of alcoholic patients with well-marked and clearly circumscribed affection of the corpus callosum. In all 3 cases there was no abnormality of the cortex or other portions of the brain except the corpus callosum, which showed, on section, a diffused gray color which ceased abruptly a few millimeters from the emergence of the bundle of nerve-fibers from the hemispheres. Microscopic sections presented the appearance of 3 zones—a middle one, to which the changes were confined, with 2 presenting no change. The middle changed zone differed from normal tissue chiefly in being less compact and more vascular, with its bloodvessels full. The neuroglia nuclei were increased slightly, and some of the small vessels were surrounded by a zone of hyaline substance. The great mass of the tissue was composed of a network of neuroglia and naked cylinders which had lost their medullary sheaths, to which loss the gray color and rarefaction of the tissue were due.

Injuries to the Skull.—Stenger,³ in dealing with the importance of ear symptoms in the diagnosis of fracture of the base of the skull and other cranial injuries, distinguishes between fresh and old injuries. In the former, symptoms of concussion are most prominent, and those of ear trouble can be used only as diagnostic helps. Discharge of blood and cerebrospinal fluid deserves great attention. The appearance of cerebrospinal fluid makes it practically certain that there is a fracture of the base. The functional symptoms are of great value, and in fresh cases a careful consideration of them will be found useful. These symptoms are evidenced by disturbance of hearing and tinnitus, giddiness, and paralysis of nerves. Disturbances of hearing are the most important, and are due to injury of the auditory nucleus of the nerve itself or to its peripheral disturbance. When the nucleus is attacked, total deafness on that side will necessarily follow, and the cerebral symptoms will be marked. When the nerve is injured in its course, one generally finds implication of the facial nerve. When the nerve is injured in its distribution, one meets with so-called labyrinthine symptoms. These are ascertained by measuring the length of time at which the patient can still hear the tuning-fork after it is applied to the mastoid process. The next symptom in this category is the failure to perceive high notes. Stenger looks on this as

¹ Am. Jour. Med. Sci., Feb., 1904. ² Rev. di Pat. nerv. e Ment., Dec., 1903.

³ Berl. klin. Woch., Feb. 2, 1903.

absolutely diagnostic of disturbance of the labyrinth. He deals with the giddiness due to injury to the semicircular canals, and points out that the type of the giddiness is definite. Unilateral nystagmus is frequently seen in connection with injuries of the head, and may point to direct implication of the canals. In this case the movements are directed to the unaffected side, and may be described as a tetany of the muscles of the eye. The only nerve-injury that points to direct injury of the ear is that of the facial, but only when the optic nerve and the organ of hearing are affected can attention be directed to the bone-injury.

Hydrocephalus.—H. Lowenburg¹ reports a case of chronic internal hydrocephalus treated by lumbar puncture with some benefit. The patient, however, died of bronchopneumonia. Lowenburg's conclusions follow: "I believe the following conditions must be present in each case before lumbar puncture should be practised: 1. Free communication must exist between the ventricles and the subdural spinal space. 2. The head must be compressible. 3. The bones must be flexible and there must be no evidence of ossification in the fontanel or the sutures. 4. Ossification is usually well advanced after the second year, therefore treatment must be instituted before this period. 5. Lumbar puncture is preferable to direct tapping of the ventricles, as there is an entire absence of all danger of the untoward complications following the latter."

NEUROSES DUE TO INFECTION.

Chorea.—L. H. Mettler² discusses syphilis as a cause of chorea and believes it is more frequently active than is generally supposed. He points out that it may result from either acquired or hereditary syphilis, and that it usually produces lateral choreic manifestations. Further, that many such cases belong to the prehemiplegic or posthemiplegic type. It would appear that syphilis must be an extraordinarily rare cause of chorea, using the word in the limited form applicable to Sydenham's type only. The cases described seem rather to be manifestations of cortical irritation from syphilitic processes and should not be classed under the head of chorea.

Galdi³ believes in an essential chorea of the heart. The signs of this are, first and most important, a marked and spontaneous variability of the diameters of the heart as estimated by percussion and triangulation of the area of dulness. This variability is still more manifest under the influence of general or local stimuli. The heart, like the mind, becomes in chorea more infantile in type, responding more readily to stimuli, whether internal or external. The other two important symptoms are arrhythmia and a murmur. Galdi quotes a case of chorea in a girl with left hemichorea and cardiac chorea, where the base line varied in the course of 40 days' observation from 9.3 to 6.5 cm., the left ventricular line from 9.7 to 6.9 cm., and the right ventricular line from 9.6 to 6.2 cm.

H. E. Marion⁴ reports a very interesting case of chorea in which a

¹ Amer. Med., Aug. 6, 1904.

² Jour. Am. Med. Assoc., Sept., 1903.

³ Il Policlin., Nov. 21, 1903.

⁴ Boston M. and S. Jour., Apr. 14, 1904.

microscopic study of the brain by Hoch showed the **nerve-cells everywhere to be markedly altered**. He says: "The nerve-cells are everywhere markedly altered. They are shrunk, their nuclei rather homogeneous; the cell-body often presents a honeycomb appearance. While these alterations resemble in many ways that form of cell change which Nissl has described as the 'chronic cell change,' it is, to my mind, very unlikely that in such a case we would have such extensive and at the same time so marked changes in nerve-cells without any corresponding disorder in the general architecture and without adequate changes in the glia. As a matter of fact, it has been found that a very similar appearance is seen in the cortexes of many individuals who die from ordinary somatic diseases, more especially those which lead to a general stasis, and we have been able to show experimentally that this appearance is produced by the action of the alcohol on a tissue, the fluid contents of which is probably somewhat increased. I regard these nerve-cell alterations, therefore, as artefacts. The glia-nuclei in the lower layers of the cortex are not infrequently found to be somewhat increased, but the nuclei are not otherwise altered. They present no active stages, and the cell-bodies are not abnormal except for the fact that many of them contain more pigment (bright yellow) than they would normally. The significance of this pigment is not clear to me, but the increase of the nuclei is evidently of little moment, as it may frequently be seen in cortexes of individuals who die from various somatic diseases. The bloodvessels often presented somewhat crumbly-looking walls and not infrequently pigment in their endothelium. The spaces around the vessels were normal and presented in no way accumulations of cells. In the vessels were seen an unusual and certainly abnormal number of polymorphonuclear leukocytes. In a word, the changes found are of very slight importance. There are no gross changes."

Tetanus.—V. Schuckmann,¹ in discussing the value of **antitoxin treatment** in tetanus, gives the history of a case treated in this way the first day of the appearance of the tetanus and 10 days after the receipt of the wound. The patient, however, died within 48 hours of the onset. Von Schuckmann gathers the clinical records of 92 cases upon which he bases his report. In 36 cases he finds the incubation-period was definitely determined, and with 5 exceptions varied between 6 and 14 days, the average being 10. In one case symptoms of rapidly fatal tetanus appeared within 12 hours after the injection of gelatin. Cases with short incubation-periods—that is, up to the end of 9 days—presented a mortality rate of 71 %, while in those of long incubation the percentage fell to 36, supporting the axiom that the longer the incubation-period, the better the prognosis. In 92 cases all were treated with antitoxin except 16, and of those treated with antitoxin there were 47 % of recoveries. This embraces cases treated by intracerebellar, subdural, intravenous, and subcutaneous injections. As the intracerebellar method attained only 25 % of recoveries, it is considered unreliable. The best results were obtained from the subdural method, which gave 80 % of recoveries.

¹ Deut. med. Woch., Mar. 5, 1903

Behring has stipulated that the injection shall be carried out before the end of the first 36 hours, but in Schuckmann's cases none so treated was saved. He believes that the matter may be explained by assuming that it is always those cases which develop symptoms rapidly and which in themselves offer a bad prognosis which are recognized and treated on the first day, while cases of a more hopeful prognosis are not diagnosed until later on and consequently injected the second or third day or at a later period. He comes to the conclusion that treatment by antitoxin does not improve the chances of the patient suffering from tetanus.

J. B. Murphy¹ reports a case of tetanus successfully treated by the **aspiration of cerebrospinal fluid** and the injection of morphin, eucain, and salt-solution. The case was one in which tetanus followed a wound on the sole of the foot, due to stepping on a piece of glass, and appearing 6 days after the accident. Treatment by antitetanic serum apparently was unavailing. Lumbar puncture was then made, and 16 cc. of cerebrospinal fluid was withdrawn. At the same time 3 cc. of a solution of eucain, morphin, and sodium chlorid was injected in the subarachnoid space, representing $1\frac{1}{2}$ grains of eucain, $\frac{1}{4}$ grain of morphin, and 3 grains of sodium chlorid. This produced an immediate good effect and was repeated a number of times. The patient was ultimately discharged well. Murphy believes that eucain is safer than cocain, as it admits of boiling for sterilization and is less likely to disturb the patient. He also believes that in very severe affections there is no reason why the cerebrospinal cavities may not be washed out with salt or other solutions by making a drill puncture of the cranium over the lateral ventricle and inserting a needle until the cerebrospinal fluid escapes; second, insert a needle into the spinal canal in the lumbar region, allowing a normal salt-solution to flow, under hydrostatic pressure, from the ventricle to the lumbar region and out of the needle at that point. This Murphy has readily accomplished on the cadaver.

John Rogers² reports a case of tetanus treated by intraneural injection of antitoxin. The patient was a boy of 12 years who received a shot-wound on the lower part of the left palm by a toy pistol. This was treated within a few hours by the application of a wet dressing. Four days later some wadding and other matter were removed from a deep lacerated wound, which was then cleaned and dressed every other day. April 1, 14 days after the receipt of the wound, his mother observed that he seemed to eat with difficulty, and the symptoms gradually developed to a severe degree during the next 3 or 4 days. On April 3, under anesthesia, the brachial plexus was exposed and in the center of each of the nerve-trunks the needle of an ordinary aspirating syringe was inserted, and from 5 to 10 minims of the New York Health Board's antitoxin was injected. The nerve swelled to about the size of the little finger. The axillary wound was closed and dressed, the patient was turned over, and the needle introduced between the third and fourth lumbar vertebrae, and after the evacuation of one-half dram of cerebrospinal fluid, an attempt was made to scratch the nerves of the cauda equina, and 130 minims of the

¹ Jour. Am. Med. Assoc., Aug. 14, 1904.

² Med. Rec., May 21, 1904.

antitoxin was injected subdurally. There was no change in pulse or respiration. The patient showed improvement in the next 24 hours. April 4 the axillary wound was opened and 5 minims of antitoxin injected in the substance of the nerve, probably the median. Some 60 minims was also injected into the loose tissue about the nerve. A second lumbar puncture was made, and 160 minims injected subdurally. In addition he was given 15 grains of chloral and 30 grains of sodium bromid by the rectum 4 times on April 4. He made a slow but complete recovery. [In view of the long period of time elapsing between infection and the development of tetanus, the case was *per se* a hopeful one. It is impossible to attribute the result to either the intraneural or subdural injections, as very potent doses of bromid were used, which, in similar cases, have led to an apparently favorable termination.]

TROPHONEUROSES.

Graves' Disease.—R. Grocco¹ discusses from a diagnostic standpoint the **special cardiac symptoms** of Graves' disease. (1) During the attacks of tachycardia, even in the earlier stages, dilation of the heart is never wanting, though it may be transitory; slight fatigue, such as that caused by climbing steps or lifting a weight, will induce it. This does not occur in neurotic palpitation. (2) There is usually an intimate connection between the amount of dilation and the degree of general asthenia, but not necessarily between either of these and the severity of the tachycardia. (3) Rapid, intense, but transitory changes in the sounds and shape of the heart are marked features of the disease. (4) In many cases the aorta is dilated and the resonance on percussion of the sternum is diminished. (5) Dilation of the large vessels causes throbbing at the root of the neck, arterial pulsation in the liver, spleen, and under the nails. Similar symptoms may also arise as the result of mitral incompetency. (6) These cardiac symptoms are not necessarily prominent, and in some cases completely disappear; in other instances the symptoms may disappear, but the heart remain hypertrophied. (7) Angina pectoris may be closely simulated, but Grocco has not met true typical angina as a complication of Graves' disease. (8) It must be remembered that rheumatic or other diseases of the heart may complicate Graves' disease. (9) It is also probable that Graves' disease predisposes to endocarditis.

J. Lepine² claims to have obtained a **serum** for the treatment of Graves' disease by a method similar to that employed in the preparation of antidiphtheric serum. The serum as obtained from thyroidectomized animals by Burghardth, Blumenthal, and others, causes distinct improvement of the symptoms, but, on the whole, has not been very satisfactory. Lepine sought to immunize a goat by feeding it with gradually increasing quantities of thyroid. Injections of the triturated gland were also tried, but discontinued on account of sepsis. Four lobes of a sheep's thyroid were fed every 2 or 3 days. Large doses at first caused diarrhea, tachycardia, exophthalmia, and dyspnea. After several months the animal

¹ Riv. crit. di Clin. Med., Jan. 2, 1904.

² Lyon méd., Nov. 29, 1903.

could tolerate 20 to 25 lobes of the gland without suffering. The serum from this goat was then injected into the cellular tissue of a dog in doses of 10 to 20 cc. It diminished the urea and caused an increase of weight; 40 cc. caused somnolence, with loss of flesh and some slowing of the heart. Even without large doses the toxic symptoms were not like those caused by the serum of thyroidectomized animals.

Scleroderma Associated with Raynaud's Disease and Addison's Pigmentation.—G. C. R. Harbinson¹ reports a remarkable case in which there was scleroderma of a diffuse type affecting hands, wrists, face, neck, and top of chest, associated with Raynaud's disease affecting the hands, nose, and ears. A deep bronzing of the skin, in distribution and characteristics typical of Addison's disease, was the principal constitutional symptom.

The Mental State in Myxedema.—H. Wolsely-Lewis² describes the mental condition in myxedema as follows: "It will appear that essential change in these patients lies in a deficient power of energizing their motor cells. They complain that they are languid and tired and tell of the immense effort it is to them to make even the simplest movement. This explains why they sit expressionless and in the same attitude for hours, like an artist's lay figure. While their perceptive faculties are fairly acute and enable them to gage their relations with the world with considerable accuracy, their power of giving out their ideas to the world is minimized almost to extinction. Perception is usually good, but there is no doubt that they do suffer from illusions and hallucinations at times. These abnormal perceptions are not a prominent symptom, and are often of the kind known as 'pseudo-hallucinations'—that is, they are not objectively very real but are simply a vivid re-perception of a 'memory image.' One patient thought that she heard her dead husband's voice; this, however, she explained, must really have been the voice of the man in the next room, because she noticed that she never fancied such a thing when he was away at his work, thereby showing her powers of observation and reasoning. Another patient, thinking much about her husband, to whom she was attached, would sometimes seem to hear his voice. Consciousness seems to be clear as a rule. Patients recognize their disability and are worried by it. This accounts for their occasional irritability and perhaps for the rare attacks of spitefulness and even violence that have been noticed. They are anxious to do their work and may be depressed because they cannot rouse themselves to do it. Apprehension is impaired to the extent that those memory associations which are required to complete any percept need a more powerful stimulus to bring them into consciousness. Hence spontaneous attention, or the instinctive selection of some stimuli in preference to others, is defective, although voluntary attention or the concentration on certain stimuli by an effort of will is good. A patient declares that, while she will sit staring vacantly before her, thinking of nothing properly, she is able, by an effort of will, to follow some particular train of thought with as much lucidity as ever. With some stuporous cases of insanity, if one suddenly shouts in the ear,

¹ Brit. Med. Jour., Jan. 16, 1904.

² Lancet, Apr. 23, 1904.

there is no indication that they perceive the unusual stimulus, but in myxedema it is found that the patient has been mentally 'startled,' though he may give little or no expression to the fact. Memory as regards retentiveness is good, but the impressibility of memory during the myxedematous state is diminished. Hence these patients do not recall many smaller events which occur while they are in this condition, but can recall with accuracy those larger events of which they took full cognizance at the time. A patient was able to give me many details of things happening some years ago and to recite with much circumstance events occurring since her recovery, but her recollection of the time during which she was ill was imperfect. Some writers state that myxedema extending over some time leads to a permanent dementia. I have had 2 patients, both of whom had a relapse of the disease due to ceasing to take thyroid extract, who exhibited little dementia after recovering a second time, though the whole disease extended in one case over 7 years. Ideation and the formation of concepts do not appear to be diminished, and the association of ideas seems to be good. There is a retardation of thought and the elaboration of an idea is difficult, but complete. These patients are coherent, and their speech, though slow, is to the point. In a recovering patient one of the earliest signs of improvement was that she began to read novels, and she now assures me that she could picture to herself the scenes described therein as well as ever and that she found no difficulty in the understanding and amplifying of such abstract ideas as 'speed' and 'thought.' Judgment and reasoning power are not defective, and once aroused to attention, the myxedematous subject can give a very sound opinion. Thus, I asked a patient, Would you prefer working half an hour every day in the week for 1d. a day or 4 hours on one day for 7d. and why? She answered that she would work half an hour each day because she would then gain 7d. for $3\frac{1}{2}$ hours' work. It took her 5 minutes to answer this question, but she told me that she had made up her mind long before that, but could not get the answer out. On inquiry she explained that she felt the answer 'on the tip of her tongue,' but failed to voice it. As far as I have observed these patients have no definite delusions, but they are inclined to be suspicious. The capacity for work is diminished and they are conscious that their mental processes are less facile and that they readily tire. They cannot follow an argument closely for long, and have to put down the book they are reading sooner than when they are well. These patients neither laugh nor cry, and any sign of emotion is rare with them. Their affective state, however, is not one of indifference; the maternal instinct is strong, and they usually retain their consideration for others and affection for their relatives. Their sensitiveness is not decreased, for one of my patients having almost entirely lost her hair, I chaffed her good-humoredly about it; this I afterward found she had felt acutely, and when she recovered was able to recall the feeling of shame which she had suffered. Their normal sense is in no way blunted. Though these patients are often described as melancholiacs, they do not appear to be more depressed than is natural as the result of the consciousness of their condition. It is essentially in

disturbances of volition and action that the peculiar mental symptoms of this condition manifest themselves. A diminution of volitional impulse produces that lack of initiative, that striking immobility of face and body so characteristic of the disease. To originate even the simplest movement requires a very special exercise of the will. An external stimulus, to produce a movement, must be unusually strong. It is at the commencement of action that the block occurs, and noticeably when once action has begun it flows more easily. The execution of the movement itself is slower than usual. Patients describe the tremendous difficulty they had, not in perception or understanding, but in action. A loud command elicits a quite inadequate response, though their appreciation of the order seems in no way diminished. It is noticeable that these patients are always more 'tired' in the morning than in the evening. One tells me that if 'a neighbor popped in to see her' it did her good, because at first she could hardly answer a word, but after a time found she conversed more easily. Another was asked to get up from her chair, to walk to the end of the ward, to sit down on another chair, and to return (the whole maneuver in a healthy person taking 30 seconds). It took her 3 minutes to do this, half the time being occupied in getting up from her chair, so that one wondered whether she had understood the request; she informed me afterward, however, that she had the greatest difficulty in making a start, but that once on the move, she could get along fairly easily. To make a simple statement, 'Yes' or 'No,' took a patient 5 seconds, but she always answered correctly; to make a complicated movement, such as 'clasping the hands behind the back,' took 45 seconds. Under treatment these times gradually shortened coequally with quickening of the pulse and rising of the temperature. On admission it took a patient 5 seconds to say what part of her face I touched; after 14 days' treatment it took her 2 seconds. I have not found that, apart from their slowness, the movements made were particularly clumsy, these patients when getting better often writing and sewing nicely. I noted in one patient that the knee-jerk, though well marked, was delayed, and the contraction of the quadriceps extensor was prolonged. I submit then that the changes in the mental condition of those suffering from myxedema are almost confined to the sphere of action. It seems necessary to suppose that either some toxin in the plasma surrounding the motor cells inhibits the chemic processes which originate a motor impulse, or that the absence of some substance from the blood interferes with the discharge. This toxin is neutralized or this essential substance is supplied by the administration of thyroid extract; the patients get well and keep so as long as they continue to take thyroid. I have observed that the simultaneous exhibition of syrupus ferri iodidi appears to assist its action. We see this class of patients described by such terms as dull, listless, apathetic, taking a long time to comprehend and to answer questions, of sluggish ideation, of sluggish mentation, demented, depressed, moping, lethargic, suspicious, of impaired memory, sleepy, torpid, contented, and irritable. I suggest that this proves on careful inquiry to be but part of the truth, and that the majority

of these cases are sent to an asylum in error and could be as well treated outside one."

Hypertrophic Osteoarthropathy.—T. C. Janeway¹ reports on 2 cases of this rare disorder. He urges the necessity for the careful recording of such cases, and believes that the problem of its true etiology still awaits solution, dependent upon a large knowledge of bone pathology and of pathologic metabolism.

Tumors of the Hypophysis without Akromegaly.—Minelli² reports a case of tumor of the hypophysis occurring in an old man who showed no signs of akromegaly during life. The tumor filled the sella turcica and measured 30 by 20 by 20 mm. There were no adhesions, and it was easily enucleated from a thick capsule. Thyroids, spleen, and suprarenals were normal. The tumor was made up of small cells without colloid substance. In tumors of the hypophysis associated with akromegaly chromophile cells containing granulations have been increased in number, so it is supposed these cells are associated with the symptomatology of the disorder, the negative side of the question being in a sense corroborated by the case cited.

The Parathyroid Gland.—W. G. MacCallum³ presents an article on a specific cytolytic serum for thyroid and parathyroid, with observations on the physiology and pathology of these glands, with special relation to exophthalmic goiter. Briefly stated, it has been shown that the destruction of the thyroid alone produces disturbances of metabolism, which appear slowly, and gradually lead to cachectic conditions—the so-called myxedema. Destruction of the parathyroid alone, on the other hand, produces the acute, rapidly fatal nervous phenomena which have so long been thought to be due to the extirpation of the thyroid. The most evident symptoms in this condition are the tetany and polypnea, which rapidly exhaust the animal. The confusion which has so long existed as to the relation of these symptoms to the thyroid depends on the fact that the parathyroids have only recently been discovered, and that, being small and inconspicuous organs, often embedded in the surface of the thyroid, they have usually been removed with the thyroid; hence the so-called early symptoms of thyroidectomy which produce their fatal effect before the true symptoms of thyroidectomy have had time to develop. Several problems in connection with this phenomenon, therefore, present themselves: (1) Are we dealing with a condition in which there is lack of some necessary secretion of the parathyroid? (2) Is there, on the other hand, a poison produced somewhere in the body which is circulating in the blood and producing these phenomena, but which, in the normal animal, would be neutralized either by the parathyroid cells themselves or by their secretion? (3) Is this poison produced by the metabolism of any particular group of cells, or, in other words, are there specific relations between the parathyroid and any other particular organ; for example, is this poison directly absorbed in the intestine or is it the waste-product in the metabolism of the muscles or the noxious excretion from

¹ Am. Jour. Med. Sci., Sept., 1903.

² Gazz. Med. Ital., July, 1903.

³ Med. News, Oct. 31, 1903.

the metabolic processes in the nerve-cells themselves? The first of these questions seems not especially difficult to approach. If the parathyroid be conceived of as producing a secretion necessary to the functions of the body, the effects of the lack of this secretion, which must be carried about in the blood, since there is no other outlet, should not be ameliorated by the removal of the blood or its dilution. In order to determine this point the blood of a normal dog was transfused directly into the veins of dog 12, which, after removal of both thyroids and parathyroids, had reached the condition of violent tetany. The result was the complete disappearance of all tetanic symptoms after about 4 hours, and next day the dog seemed quite well. It might be objected that in so doing we injected with the blood of this normal animal the circulatory secretion of its parathyroid. The next day, therefore, when the effect of this transfusion of blood had apparently passed off and the dog was again plunged into violent tetanic spasms, instead of transfusing normal blood, the animal itself was bled and a somewhat larger quantity of normal salt-solution (150 cc.) allowed to run into the veins. The same immediate, or almost immediate, amelioration of the symptoms with complete disappearance of the tetany followed. Next day the tetany had reappeared and the bleeding and infusion were again carried out with success. So also upon the next day, although the dog had by this time become very weak and the tetany very slight,—50 cc., therefore, of blood was removed and 200 cc. of salt-solution infused,—the result was the immediate improvement of the dog, so that he could run about. After this there was, strangely enough, no recurrence of the tetany and the animal passed gradually into a cachexia, due, perhaps, to the thyroidectomy, and died after several days. Similar results have been obtained by Lusena and others. The idea that the parathyroid is active chiefly in neutralizing some toxin seems, therefore, more plausible, although it is perhaps not absolutely proved by this single experiment. It may be said, therefore, that while it seems improbable that the parathyroids secrete a necessary material which is circulated in the blood, the lack of which produces the disturbances described, it does seem probable that they produce a material which neutralizes poisons produced elsewhere, poisons which, if not so neutralized, may be mechanically washed out, with the relief of the symptoms. Of course, it may be claimed that the parathyroid secretion is necessary to the metabolism of, say, the nerve-cells; that without it the perverted or incomplete metabolism throws the nerve-muscle apparatus into the tetanic state described, but since this must be due to the presence of stimulating materials, it forms only an example of the neutralization idea in which the metabolism of the nerve-cell is particularly concerned. Together with the results of other observations, this tends to show that, while the thyroid gland has a definite and marked influence upon the course of metabolism, the function of the parathyroid is directed to a different purpose and is not specially concerned with metabolism. It is interesting to note that daily observations of the urine of dog 15 in the preceding series, in which a specific antithyroid serum was several times injected, there was after each injection a temporary alteration in the

nitrogenous constituents of the urine which corresponded in every way with that observed after thyroidectomy. In the course of these experiments the idea naturally suggested itself that there might be some disease analogous in its symptoms to those produced by the extirpation of these glands, and the symptom-complex of exophthalmic goiter with all its difficulties of explanation presented itself at once as at least somewhat similar. Perusal of the literature showed that this idea had been put forward by Gley and acted upon by Moussu, who treated a case of exophthalmic goiter with the parathyroids of the ox. Moussu reports a marked improvement in his case, which was, however, unfortunately carried off by tuberculosis during the treatment. Since that time there has apparently been no attempt made to treat this disease with the parathyroid extract.

Neuroses of the Status Lymphaticus.—A. P. Ohlmacher¹ says: "From my observation on lymphatic epileptics and my reflection on these studies, I am strongly disposed to the belief that a periodic increase of intracranial pressure acting either on the exterior or interior of the brain, or on both portions simultaneously, and manifesting itself as a result of the tendency to edema characteristic of status lymphaticus, is a directly provocative factor of such neuroses as spasm of the glottis, tetany, infantile eclampsia, epilepsy, and the various forms of sudden death incidental to the lymphatic state. According to this view, the clinical phenomena would depend on the extent and location of the intracranial edema, or, in other words, on the portion of the encephalon particularly subjected to pressure. In event of compression of the external portion of the cerebrum various convulsive disorders of the motor apparatus are provoked; when the balance of pressure becomes so distributed as to raise the intracerebral pressure, other severer symptoms occur, ending, in case of sufficient pressure on the floor of the fourth ventricle, in sudden respiratory or cardiac failure. Granting the hypothesis just advanced, we are brought one step nearer the explanation of the *modus operandi* of several obscure neuroses whose kinship has repeatedly been recognized on purely clinical grounds and whose morbid anatomic association is proved by the establishment of the lymphatic state as a common basis for all. Cheadle's dictum that 'laryngismus, tetany, and general convulsions are the positive, comparative, and superlative of the convulsive state of childhood,' finds support and elaboration."

MOTOR NEUROSES.

Myotonia.—Schiefferdecker and Schultze² furnish a very elaborate and extensive monograph on the subject of congenital myotonia, tetany with myotonic symptoms, paralysis agitans, and other disturbances marked by hypertrophy of the muscle-fiber. Their work constitutes a monograph embracing 4 sections of the *Zeitschrift*, and nearly making up the full volume of this publication. As an introduction, the clinical

¹ Jour. Am. Med. Assoc., Feb. 13, 1904.

² Deut. Zeit. f. Nervenheilk., Dec., 1903.

description of a number of cases of myotonia congenita are reported, from which portions of muscle were removed for careful histologic examination by Schiefferdecker. He soon found that a study of the changes in the muscle-fiber would necessitate an entirely new method of investigation. Cases already on record were so conflicting in reports, owing to the different methods of research, that no precise basis for comparison was obtainable. He therefore made elaborate investigations of the muscles in various conditions, checking his results by making corresponding examinations of the muscles of sound individuals and of the lower animals. It is impossible to epitomize the elaborate work which was done. In myotonia he determined that there was a distinct variety of disorder of the sarcoplasm, following which the muscle-fibrils were diseased. The hypertrophy of the muscle-fibers and increase in their nuclei appear to be a secondary process. The increase in the nuclei was proportional to the hypertrophy. His findings indicate an active state of hypertrophy. In paralysis agitans not only the muscle-fibers, the fibrillas, but also the muscle-spindles were diseased, while the nerves in the spindles as well as in the muscles presented no morbid condition. There was also considerable increase in the pigmentation about the muscle-cells. This work must serve as a necessary foundation for any further discussion along the line of investigation of so-called muscle disorders.

Paralysis Agitans after Accident.—K. Ruhemann,¹ in concluding an admirable article on the occurrence of paralysis agitans after physical accidents, while admitting that this disorder, especially in elderly people, most commonly comes on without any previous accident, yet in certain undoubted cases there is a causal connection between the paralysis agitans and various accidents of a physical character. These characteristically appear within a comparatively short time after the occurrence of the trauma, and he goes to the point of believing that in certain instances the trauma is the sole and only cause of the disorder.

PSYCHONEUROSES.

Hysteria.—Mitchell and Spiller² report a case of uncomplicated hysteria in a male lasting 30 years, with a postmortem examination which developed no anatomic changes that are demonstrated by the most recent methods. The case had been under the observation of Mitchell at intervals during that entire period of time.

T. D. Savill³ says he has encountered 7 different kinds of **hysteric skin eruptions**: (1) Attacks of pallor, which generally accompany or alternate with some of the hysteric cerebral attacks. (2) Attacks of flushing, the flush-storms or morbid blushing which affect a part or the whole of the body, and are met in nearly all hysteric patients. (3) Small, extremely fugitive patches of congestion, abrupt in outline and localized on parts usually pale. (4) Dermatographia. (5) Acroparesthesia, erythromelalgia, and Raynaud's pallid fingers. (6) Exudative skin-conditions,

¹ Berl. klin. Woch., Apr. 11, 1904. ² Jour. Nerv. and Ment. Dis., Oct., 1904.

³ Lancet, Jan. 30, 1904.

such as urticaria, erythema, and localized circumscribed edema. These are associated with hysteria in 85 % or 90 % of all cases in Savill's experience. (7) Localized ischemic conditions presenting constriction of arterioles for a given area, as, for example, of the limb.

Epilepsy.—The work on epilepsy by William P. Spratling¹ is the most important contribution to the subject that has appeared in the English language for many years. It is based very largely on Spratling's opportunities for study and observation of this terrible affliction during his superintendency of the Craig Colony for Epileptics. Contrary to the somewhat common belief, it is Spratling's observation that the disease is more frequent among men than among women, in the proportion of about 20 to 16. These figures are reached by excluding all epilepsies due to alcohol and syphilis, which epilepsies occur most frequently in men and which have a tendency to raise the proportion of the disease. In regard to the relation of injury to epilepsy, Spratling found that in 500 women who came under his observation it was an alleged cause in 18 only—about $3\frac{1}{2}$ %. In 814 men it was the cause in 70—about $8\frac{1}{2}$ %. In 73 cases out of 88 occurring in both sexes the injury was received at the twenty-fourth year. It, of course, is evident that in a disease which develops before the age of 20, traumatism, which is so frequent, is very likely to be the alleged cause, and it is also apparent that the percentage of frequency is greater among men, who are more subject to injury than women. The real relation of trauma to epilepsy cannot be established by these figures. Relative to the question of elevated temperature before and after the fit, Spratling says: "Taking 516 grand mal seizures collectively, it is observed that 297 showed an increase in temperature of from 0.2° to 3.5° immediately after the fit. In the same group it was seen that 80, or 15.5 %, showed subnormal temperatures immediately after the fit, ranging from 96.4° to 97° , and 98° in 31 others. These low temperatures Spratling is disposed to attribute to causes that operate generally to produce low temperatures in other conditions, such as asthenic disorders of long standing, defective nutrition, idiocy, imbecility, and parietic dementia. In discussing special symptoms of the fit Spratling says he fails to recall a single epileptic convulsion in which both pupils were not more or less dilated. It is with great pleasure that one notes the comparatively favorable prognosis that he, from his large experience, is disposed to make. He says: "Notwithstanding the chronicity of the affection, the results following treatment in many were such that I have no hesitancy in stating that epilepsy is not infrequently a curable disease, irrespective of its duration, the rule being that recent cases are twice as liable to respond to treatment as chronic ones. Out of 16 patients who recovered the average age at the onset of the disease was 15 years. Epilepsy beginning under 10 years is least favorable as regards cure or improvement, while cases in which the aura occurs between 15 to 20 years are most favorable; between 20 and 25 years, less favorable, while senile epilepsy is essentially a tractable disease. Speaking of the influence of attacks upon the mind, he states that it is clear from his tables that the

¹ Philadelphia, W. B. Saunders & Co., 1904.

oftener the attacks occur, the less favorable is the mental condition, and he agrees with the general belief that grand mal seizures are more amenable to treatment than petit mal or psychic attacks. He has observed that the greater the length of time between the appearance of the aura and the fit, the more readily will the case yield to treatment. A very common cause of death in epilepsy is pulmonary tuberculosis, this being the cause in 24 % of 150 deaths. Next to tuberculosis status epilepticus induces a fatal termination. Epilepsy undoubtedly tends to shorten life. It does this in two ways: first, by its effect alone, and, second, through its onset so early in life that the majority of those so affected die before middle age is reached. As to the etiology of epilepsy, Spratling finds that the old lesions of infantile cerebral hemiplegia are the most frequently found in the brains of epileptics, and it seems to be a noteworthy fact that the smaller the lesion in infantile cerebral palsy, the greater the epilepsy and the liability to its occurrence. It is worthy of note that in many epileptics of the palsy type the lesion is so slight that no real paralysis exists during life. In reference to the sclerosis of the cornu Spratling believes, with Fère, that while sclerosis of this convolution is but the local expression of widespread sclerosis of the cortex, yet this sclerosis is secondary in character. Very frequently old epileptics present small cysts in various portions of the brain, especially in epilepsy which develops in middle life, probably secondary to vascular changes. Under the consideration of the general treatment of epilepsy Spratling directs greatest attention to the treatment of the epileptic himself, rather than to the treatment of his disease, and to the great importance of controlling the patient, in which regard the general practitioner is greatly handicapped, and this serves to explain the better results obtained under colony control. He strongly asserts that the more absolutely the physician is permitted to control the patient in every respect, the more promising the hope of amelioration or cure. In using the bromids he believes in restricting the ingestion of salt and keeping the doses as low as is consistent with a reasonable control of the epileptic phenomena. Nocturnal epileptics should get larger doses at night, the converse being true of those of diurnal habits. For instance, if 15 grains a day are being taken, 30 should be given at night in nocturnal cases. He does not think that bromids should be administered in conjunction with meal hours; an hour before or after is best, as they act more promptly on the stomach, and if taken before meals a smaller dose will suffice. If given with Vichy or Apollinaris water, their value is enhanced. The administration should not be interrupted unless the patient's condition imperatively demands it. Mothers who are nursing babies should not take bromid. Sudden withdrawal is never admissible. To do this is to invite disease or status epilepticus. To prevent bromid intoxication small doses are to be used and the patient is to be watched. By easing the disquiet often attendant upon the menstrual flow, increased frequency of fits and necessity for large doses of bromid may be obviated. Spratling finds that under the withdrawal of salt from the diet 10 grains of bromid is as effective as 20 grains in the ordinary way; the difficulty consists in having the food

suitably prepared. Of other drugs he speaks with reserve. In reference to the question of operation he says: "Operate as soon after the receipt of injury as possible, and never let a second convulsion follow the injury, if it can be prevented by surgical intervention." This, of course, applies only to traumatic cases. The more common epilepsies due to organic lesion are not operable. As to the pathologic anatomy of epilepsy, sections written by T. P. Prout and L. P. Clarke, their views have been set forth in former issues of the YEAR-BOOK. They believe that they have demonstrated characteristic changes in the motor cells of the cortex.

B. Onuf¹ contributes a very important study of the **features of the epileptic attack**. This is based upon observations at the Craig Colony for Epileptics. In reference to the initial cry, erroneous conceptions are present. This noise is purely of spasmodic origin, due to the respiratory muscles driving air from the contracted glottis. The bleating-like tremor of the cry is explained by the assumption that the initial spasm is not purely tonic, but in fact is slightly clonic. It is more often a low, protracted, tremulous groan than a sharp shrill noise, and never an articulate word. Regarding the pupils, Onuf finds that they are not invariably dilated in the epileptic attack, and not always immobile. He has seen 2 cases in which the pupil was not dilated in the convulsive stage, although in one the attack was very severe. Usually, however, the pupils are dilated and the dilation of the pupil is in proportion to the severity of the attack. Moreover, at the very beginning of the attack the pupil may be extremely small and suddenly dilate. At the beginning of the stertorous stage the pupils may again be found contracted. He calls attention to the fact that in hysteroepilepsy the pupils may sometimes be found contracted, and the physician should be on his guard as to the pupillary condition in the diagnosis of these various diseases. Very frequently it was noted that the eyes were open and turned up or to one side, and, as a rule, the eyes and head turned to the same side, although both might change in position during the attack. In the beginning of the tonic stage the head may be drawn toward one side, while at the end of the clonic stage it may be turned to the opposite side. The head is as often brought forward as turned backward, while the eyes in many cases stare directly forward. The position of the limbs varies greatly in different cases: the upper extremities are more frequently flexed than extended at elbows and wrists, but there are cases in which, at the beginning of the tonic stage, either one or both of these joints are extended. In the lower extremities extension of the legs and feet is by no means the rule, as semiflexion of the legs and thighs is often observed. The attitude of the upper extremity of one side may be different from that of the other side, and the lower extremity of one side differ in attitude from that of the other. As to the condition of consciousness, great difficulties are encountered in determining to what extent it may be abolished, but Onuf is disposed to think that absence of consciousness is not so frequent as ordinary descriptions imply. Relative to the condition of the tendon-reflexes, he calls attention to discrepancies of statement that appear in the literature. In his experi-

¹ Amer. Med., Jan. 30, 1904.

ence the knee-jerks were more frequently exaggerated than diminished. In one or two cases there was typical ankle-clonus. In other cases there was an exhaustive ankle-clonus. One case in which attacks occurred every 2 or 3 minutes was instructive. In one attack the knee-jerks were exaggerated; in the intervals they were normal. In one such test the tapping of the patellar tendon was repeated until the attack occurred; it was then noted that the knee-jerks all at once became lively, and at the same moment another attack set in. Exaggeration of the knee-jerk was not found in organic cases alone, but in cases unattended by primary organic disease. In the postconvulsive stage he found them more frequently increased than diminished, and sometimes attended by spurious or typical ankle-clonus, contrary to the observations of others.

W. A. Turner,¹ in considering the **mental condition in epilepsy** in relation to particular cases, and basing his remarks upon his observation of the epileptics who have been under his care in the English Colony for Epileptics at Chalfont St. Peter, concludes: "1. A total of 161 cases, which have been under my observation at the Colony for Epileptics, Chalfont St. Peter, has been used for the investigation. 2. The mental features of the interparoxysmal state have been divided for descriptive purposes into 4 classes, the first containing those epileptics without any obvious mental impairment and the fourth those with the highest grade of dementia. 3. The interparoxysmal mental condition is discussed in its several varieties and degrees, with special reference to the influence of sex, hereditary disposition, age at onset, and character, duration, and frequency of fits. 4. Sex has little influence upon the mental condition, but it may be stated in general terms that males are numerically more afflicted than females (91 % of the former to 78 % of the latter), but that the highest degree of dementia is somewhat more common in women than in men. 5. A family predisposition to epilepsy and insanity, although not necessarily militating against the retention of normal mental faculties, favors the supervention of some degree of mental impairment. A higher percentage with a hereditary history is found among those epileptics who show the profounder degrees of dementia than among those who show merely impairment of memory or a normal mental condition. 6. The duration of the disease influences to some extent the mental condition. Mental impairment is less frequent when the fits have lasted for under 5 years, just as mental integrity is less commonly seen when attacks have persisted for 10 or more years. But mental health and mental deficiency are observed in cases in which the disease has lasted respectively for over 20 years and for less than 5 years. 7. The age at the onset of the convulsions influences to some extent the subsequent mental condition, for the earlier the onset, especially during infancy and childhood, the less the probability of an unimpaired mental state. 8. The character and combination of the fits have an important relation to the mental condition, the profoundest degrees of dementia being most commonly seen when the major and minor attacks coexist. The petit mal seizures occurring alone are found with the lower grade of mental impairment.

¹ Lancet, Apr. 9.

When the grand mal occurs alone, mental health is as common as mental deficiency. 9. There is a direct association between the frequency of the fits and the mental state—the more frequent the seizures, the greater the degree of mental impairment, and vice versa. Fits recurring in series are accompanied by a high grade of dementia. 10. The term “facies epileptica” is applied to the physiognomy characteristic of the disease in many epileptics. It is found more commonly with the higher grades of dementia, but its existence is not limited to such cases, for it is observed in those with only impairment of memory as well as without any mental failure. 11. The view is upheld that the interparoxysmal mental condition seen in most cases of epilepsy is one expression of the neurosis of which the fits constitute another; that the former is, therefore, not directly dependent upon the seizures, and that the frequency and characteristic combination of the paroxysms in association with the degree of mental failure indicate the severity and intensity of the disease. 12. The following figures show the percentage frequency of the 4 classes of mental deficiency among the 161 cases used for the purposes of this paper: Class A, intellectually normal, 13.6 %; Class B, with impaired memory, 31.6 %; Class C, feeble-minded, 25.4 %; and Class D, demented, 29.1 %.

Galdi and Tarugi¹ discuss the **relation between epilepsy and acidity of the urine**. In a case in which there was a distinct relation between the appearance of epileptic attacks and labial herpes Giovanni suspected that the fits were related to hyperacidity of the urine. Numerous examinations were made by the authors, who confirmed the connection between epilepsy and urinary acidity, but not a connection between epilepsy and urinary toxicity. Elaborate experiments were made by injections of rabbits to prove toxicity, and the acidity was carefully estimated by the most approved methods. The conclusions at which they arrive are as follows: (1) The specific gravity of the urine was related with the acidity, but not with the toxicity of the urine. (2) The acidity did not correspond to the toxicity of the urine. (3) The increase of the acidity of the urine coincided with the diminution and ultimate disappearance of the power to cause convulsions. (4) The urine in this patient was generally hypotoxic, a few times hypertoxic, but only when tested in the intervals between the fits. The authors, therefore, could trace no causal relation between the increase of toxicity and the epileptic fits. (5) The power to cause convulsions was always present in the urine passed just before a fit, never in that passed after. (6) There was a relation between the urinary acidity and the fit inasmuch as the acidity was increased after a fit.

J. Donath² finds that **cholin not only is present in epilepsy**, as a rule, but is also capable of producing infection if injected into animals. Genuine Jacksonian and syphilitic epilepsy is as positive in the evidence of cholin as in organic disease of the central nervous system, in which the presence of cholin is to be attributed to disintegration of nerve tissue. In simple hysteria, hysteroepilepsy, and neurasthenia Donath found no cholin in the blood. It appears that cholin disappears in the blood, however, for if injected into the veins or the brain, it cannot be detected

¹ Il Morgagni, June, 1904.

² Hoppe-Seyler's Zeit., Oct. 31, 1903.

in the urine. When injected into the cerebral cortex, it produces clonic and tonic convulsions, which frequently terminate in paresis. The convulsions were mostly general, but were frequently on the one side. In experimenting with neurin Donath found no appreciable difference between the two substances. Both are powerful nerve-poisons, having especially effective action upon intercerebral tissue. He believes that in epilepsy two causative factors are at play—an increased excitability of the cerebral cortex and the operation of a toxic substance. The presence of cholin in the cerebrospinal fluid, as in organic diseases of the nervous system and experimental operation, led him to believe that cholin plays an eminent rôle in the production of the fit.

L. P. Clark and T. P. Prout¹ present a study of the subject of **status epilepticus**. They state that status epilepticus is the maximum development of epilepsy, in which one paroxysm follows another so closely that coma and exhaustion are continuous between seizures. The state is almost always sooner or later accompanied by a marked rise in temperature, pulse, and respiratory frequency, indicative of the degree of exhaustion. There are many varieties and equivalents. Status being confined largely to the major form of epilepsy, its variations are less marked than in epilepsy proper, but status may be composed of delirium, stupor, or coma, cough or hiccup, and a variety of psychic states based upon cortical discharges resulting in more or less physical and psychic exhaustion. These different varieties and equivalents have been included in the authors' study. From the convulsive standpoint status may be composed of ordinary major attacks or of one prolonged tonic or clonic spasm lasting for an hour or longer or until death. The seizures may be wanting in tonic or clonic elements, but if either be abbreviated, the form is the one usually modified or omitted. Status composed entirely of continued or static attacks are not unknown, but are rare. Status may exceptionally consist entirely of psychic seizures, with or without a fever-curve. Status occurs most frequently in those cases of ordinary epilepsy in which major attacks predominate. Of the various forms of epilepsy terminating in fatal status, only the grand mal type is in evidence, psychic status rarely terminating fatally. Status is a noteworthy ending in all Jacksonian epilepsies, some authors to the contrary notwithstanding. The frequency of status in partial epilepsy is shown by the frequent occurrence of partial paralysis in such cases. One-third of the status cases on record have been dependent upon organic lesions of the cortex in early infancy.

Herman Lundborg, in a brochure published at Upsala, 1903, furnishes a painstaking study of the condition of **progressive myoclonus epilepsy**, both from the literature and from a somewhat large personal experience. He presents 10 personal cases and 31 found in the literature of the subject. These are represented by 30 families showing a strong familial tendency in the distribution of the disorder. The general considerations of the disorder, its symptomatology and prognosis, are fully set forth, but nothing particularly new is presented. An outline of the condition appeared

¹ Am. Jour. Insanity, Oct., 1903.

in the YEAR-BOOK for 1903, drawn from the capable description of the disease by Clark appearing in the American Journal of Insanity.

Crisafulli¹ reports the case of a man aged 20 who began to suffer from epileptic fits and simultaneously presented **enlargement of the thyroid**. Two years of bromid had no effect. Treatment of the thyroid by electricity and iodine brought about reduction in size and complete cessation of the fits. Crisafulli believes this goes to support the contention that there is a relationship between epilepsy and the thyroid.

J. Esmenard² asserts that **the Babinski sign** can generally be detected in an epileptic attack at some period of the fit or in the postepileptic stage. Irritating the sole of the foot during the epileptic attack brings about varying results at different periods of the attack. (1) There may be no movement, then plantar flexion of the toes. (2) No movement, then dorsal, then plantar, flexion of the toes. (3) Dorsal flexion of the toes during the entire duration of the attack. Finally, this sign may precede a few minutes or many hours. The Babinski sign is extremely rare in hysteria; its presence in the convulsive attack is strongly presumptive of epilepsy.

Migraine.—R. Fuchs,³ discussing migraine and its treatment, considers migraine to be an inherited nervous affection occurring in families in which other nervous affections are found. According to Fère, in 232 out of 308 cases of epilepsy there was a history of migraine in one of the parents. Migraine is also found in combination with other nervous affections. The attacks of migraine are often indistinguishable from hysteria except by a careful consideration of the whole case. As to treatment, the most important general indication is the lessening of nervous irritability. To this end Fuchs employed a systematic bromine treatment. Should this be unsuccessful, nerve-sedatives are given during the attack. Fuchs strongly recommends a combination of phenacetin, caffeine, codeine, and guarana as being most effective and least tonic in its effect.

Mangelsdorf⁴ describes a phenomenon which he has observed in a number of cases of **migraine and epilepsy**, consisting in the distention of the stomach, which appears a day before the attack. He reports a number of cases in which, by carefully outlining the stomach in a diagrammatic manner, the dilation is shown to have occurred.

F. Hare, Inspector General of Hospitals in Queensland, has published a monograph containing some interesting ideas in regard to the **mechanism of migraine and asthma**. He believes that during the spasm there is a widespread vasocontraction of the cutaneous vessels. This is compensated to some extent, although not always fully, by an area of vasodilation of some part of the cranium. This can sometimes be demonstrated in the retinal vessels. The effect of the reduction of the total amount of blood is to disperse migraine, as is occasioned by hemorrhage of all sorts. Hare believes that the evidence of this vasodilation of the cerebral area is complete, and it is highly probable that the sensory symptoms, including the initial symptom often spoken of as an **aura**, is

¹ Il Morgagni, Apr., 1903.

² Die Heilkunde Rai, 1903.

³ Thèse de Paris, July 17, 1903.

⁴ Klin. Woch., Nov. 2, 1903.

due to a similar mechanism. He adduces a similar line of reasoning to explain attacks of asthma.

MENTAL DISEASES.

Motor Symptoms of Mania and Melancholia.—W. H. B. Stoddart¹ contributes a very interesting paper on the motor symptoms of mania and melancholia. He insists upon rigidities as being common in melancholia, differing in intensity with the degree of mental disorder. In a severe case he says the patient cannot raise the elbows above the level of the shoulders, and in cases of melancholic stupor the patient stands in an attitude of general flexion and abduction and complete absence of voluntary motion, but if there is present some degree of agitation, it shows itself most in movements of the wrist and fingers, ankles and toes, the rigidity above mentioned being most pronounced in the large joints, especially elbows, shoulders, and hips. The patient stands, as rigidity of the hips renders sitting uncomfortable, rocks the body from foot to foot by movements of the ankles, or constantly picking the skin with the fingers and fumbling with the clothes. If the agitation is still more marked, it shows itself in larger movements of the hands and feet, and some hip movements may come into play, while slight movements of the knees may produce a rocking of the body. In slight cases of melancholia in some instances the patient sits with comparative ease and is prone to indulge in a to-and-fro rocking movement at the hips, as well as the small joints, the restlessness, however, being most marked in the periphery. The movements of mania contrast strongly with the rigidities of melancholia. The movements of the maniac in a state of motor excitement take place for the most part at the large proximal joints; the trunk sways freely as the patient walks, and there is exaggerated movement of the hips. In the waving of the arms, which is so frequent in mania, the greatest movement takes place at the shoulders, and there is little movement of the wrist and fingers. The maniac shakes hands from the shoulders; the melancholiac, from the wrist. In the maniac the attitude of prayer is with the hands raised to heaven; with the melancholiac the attitude of prayer is with the hands crossed at the sternum. The typical attitude of the maniac is with the elbows close to the side; that of the melancholiac, with the elbows abducted. Stoddart calls attention to correlated observations in health. If the arm of the normal individual in an indifferent mood is allowed to rest upon an automatoscope, it is found that the instrument records a slight tremor. If the individual is given an unpleasant stimulus, as the smell of asafetida, there is adduction of the arm. If a pleasant stimulus is given, there is slight adduction. Stoddart's contention is that in melancholia there are characteristic movements at the small peripheral joints; that the characteristic movements of mania occur at the large proximal joints. He endeavors to show that most of the delusions of the melancholiac arise from his feeling of inactivity, while the delusions of the maniac arise from

¹ Lancet, July 5, 1904.

the feeling of activity secondary to the stimulation of his cortical neurons.

Paretic Dementia.—G. A. Lawrence¹ contributes a careful study of the cerebral cortex in the normal human brain and in dementia paralytica. He inclines to the belief of the three-layers type of cell-arrangement in the cortex as the general plan, with variations in special parts—as, for instance, in cornu ammonis. He summarizes these striata as follows: First, or superficial layer, containing but few nerve-cells, many neuroglia and many chiefly tangential fibers. The first two elements only are seen with the Nissl stain, whereas the latter element is most conspicuous with Weigert's stain, and for this latter reason Ramon y Cajal designated it as the tangential-fiber layer; second, or pyramidal-cell layer, to reduce the layering of the cortex to its lowest terms, and including the small, large, and giant or Betz pyramidal cells, all in this one layer; third, or spindle-cell layer, including both the spindle-cells which are in the majority and the less numerous irregular polygonal cells. Below these 3 layers is the subcortical white medullary substance.

A. R. Diefendorf² presents a careful study of the blood and its changes in paretic dementia, from which he concludes as follows: Dementia paralytica is accompanied by a moderate and progressive anemia, involving especially the hemoglobin and becoming more marked as the disease progresses. The terminal state of the disease is accompanied by a rise in the hemoglobin and erythrocytes and a leukocytosis. Paralytic attacks are accompanied by a leukocytosis. Throughout the disease-process there is a pathologic increase of polymorphonuclear leukocytes, which reaches its height during the terminal state. States of paretic excitement, stupor, or quiescence, not terminal, are not accompanied by any characteristic blood-changes. The presence of a leukocytosis accompanying the terminal state and paralytic attacks is significant evidence in favor of the toxic origin of the disease.

E. Raimann³ disagrees with Bruce regarding the rôle played by *Bacterium coli* and its products in the development of paretic dementia. He believes that the paralysis is the expression of the toxin, but that the toxemia does not necessarily arise in the intestinal tract. Henry Marcus⁴ presents a very important study on the etiology of paretic dementia, based on 400 cases—352 men, 48 women. Syphilis was found in 59 %; alcoholic excess in 20 %. Of the men, 63 % gave a history of syphilis. He found that by comparing the statistics relative to syphilis with the social standing of the patients in proportion as they belonged to the higher orders and therefore presented a more complete history, the proportion of syphilis increased.

C. T. Hansen and P. Heiberg⁵ present tables from which they draw conclusions as to the usual age at which syphilis is contracted, and at which general paralysis develops. The greatest number of syphilitic infections occurred between the ages of 21 and 25; the greatest number of

¹ Jour. Nerv. and Ment. Dis., Nov.-Dec., 1903.

² Am. Jour. Med. Sci., Dec., 1903.

⁴ Hygeia, 1902.

³ Wien. klin. Woch., 1903.

⁵ Arch. f. Dermat. u. Syph., 1902.

cases of general paralysis developed between 36 and 40. There is, therefore, on an average an interval of 15 to 18 years between primary syphilitic infection and the development of paretic dementia.

Ema de Pavlekovic-Kapolna¹ attempts to differentiate anatomically between **general paralysis and diffuse cerebral syphilis**, and reaches the conclusion that such differentiation can be made.

Von Donath² has treated a number of cases of paretic dementia by the subcutaneous **injection of normal salt-solution**. Usually the condition showed immediate improvement. Many of the serious episodes of the disease may be promptly and completely improved by this measure.

The Katatonic Form of Adolescent Insanity.—An editorial in the *Lancet*, June, 1904, says that the adolescent forms of dementia have received much attention during the past few years, especially as regards their bacteriology and treatment. Dr. Lewis C. Bruce, medical superintendent, and Dr. A. S. M. Peebles, assistant medical officer, of the Perth Asylum, Scotland, have published in the *Journal of Mental Science* for October, 1903, a series of observations on the katatonic form of adolescent insanity which include certain new clinical and pathologic facts of interest. Twelve cases of the disease—10 females and 2 males—were investigated as regards physical symptoms, conditions of the blood, and the presence of bacteria in the blood or tissues. The history of the cases conformed to the classic descriptions of Kahlbaum and Kraepelin as given in the textbooks. Nine men and 1 woman were in the period of adolescence; 1 woman was over 30 and 1 man over 40 years of age, "yet the disease was absolutely typical in both." Among the physical symptoms it was noted that the alimentary canal was disordered in every case; there was no desire for food, and vomiting after a meal was very common. The cardiac action was rapid, irregular, and intermittent. The above symptoms occurred in the acute stage of development of the disease, and were succeeded by the characteristic phenomena of the next or katatonic stage. In no case under observation did the acute stage last longer than 4 weeks. The katatonic stage was ushered in by a distinct febrile attack in 50 % of the cases, or in default of the febrile attack a high degree of leukocytosis was developed. The alimentary and circulatory systems continued to show the same physical disorders as before, and the extremities now grew cold, cyanotic, and edematous. The temperature was uniformly sub-normal, and patients in this stage were particularly "liable to tubercular infection." The mental state was one of stupor complicated with delusions of a persecutory nature. Occasional impulsive actions, stubborn mutism, rhythmic movements, and a condition of muscular hypertonicity with resistance to induced movements constituted the symptoms of this stage. Examination of the blood showed that immediately upon the onset of the stupor the leukocytes fell to below 8000 per c.mm., but soon rose again to between 12,000 and 16,000, and the percentage of polymorphonuclear cells fell to about 60. As recovery set in the percentage of the latter increased. Bacteriologic examination made in 8 cases. Three of these gave positive results, 1 gave a negative result.

¹ Thèse de Lausanne, 1903.

culture of a streptococcus was obtained which agglutinated in the serum of patients suffering from katatonia. "We have tested," add Dr. Bruce and Dr. Peebles, "the agglutinative power of the blood of 50 other patients, not cases of katatonia, to this streptococcus, and only 5 gave the agglutinative reaction." It is probable, therefore, that a specific agglutinin is present in the blood of patients suffering from katatonia. Experimental observations were then made on rabbits with cultures of this organism. By infecting rabbits through the alimentary tract or bloodstream with the streptococcus a condition of malaise with irregular temperature, increased skin-reflexes, and mental hebetude was induced. This disease tended to terminate naturally in rabbits in about 6 weeks, when a condition of immunity was established to this organism. The treatment of katatonia Dr. Bruce and Dr. Peebles consider to be entirely unsatisfactory. All but one of the cases treated by rest in bed, fluid diet, and saline purgatives "ran through the various stages of the disease unchecked." Attempts to procure a serum for the treatment of the disease were made by immunizing a goat to the streptococcus obtained from an acute case of katatonia. The serum of this goat was used to treat 2 patients in a condition of stupor, by subcutaneous injections of 12 cc. daily. Two other stuporous cases were treated with 10 cc. doses daily, and 5 other cases were treated with subcutaneous injections of sterilized broth cultures of the organism. The object in these serum or broth injections was rapidly to raise the active immunity of the patients. The serum obtained from the goat gave no beneficial results, and the active immunization of the patients in the stuporous stage produced no curative effect. Dr. Bruce and Dr. Peebles conclude that though katatonic dementia is characterized by an acute toxic condition of definite onset and course, accompanied by definite changes in the blood and attended by a condition of mental confusion with stupor and katatonic rigidity of the muscles, the disease tends to run its course unchecked by ordinary medicinal or special serum treatment, and that further investigation is needed for the discovery of an effective "anti-serum" for its treatment.

The Prognosis of Katatonic Manifestations.—E. Meyer,¹ as a result of investigations of 46 well-marked cases of katatonic manifestations, contends that the more rapid the onset with early stupor, the better the outlook; while tardy progress with insidious onset gives an unfavorable prognosis. Fourteen of his cases terminated in fair recovery. The prognosis, therefore, in katatonic cases, while serious, is not absolutely unfavorable.

Protracted Alcoholic Delirium.—Soukhanoff and Wedensky² call attention to the protracted delirium which sometimes follows delirium tremens. This condition of continuous delirium or mild mania is usually marked by hallucinations of hearing referred to both sides. The voices of which the patients complain are always very distinct, and have different sounds, so that they sometimes seem to belong to a man and at other times to a woman or to both. Certain auditory hallucinations are the natural result and are quite uniform. The patient commonly hears reproaches

¹ Münch. med. Woch., 1902.

² Nouv. Icon. de la Salpet., Dec., 1903.

turning upon various instances in his life. Occasionally he hears obscene words or some one tells him of approaching death. Occasionally there are hallucinations of smell, usually attributed to the individuals whose voices are heard. Although alcoholic delirium of this sort may last for years, the tendency is for the intellectual disturbance gradually to recede, the hallucinations diminish, become less intense, and finally disappear altogether. The prognosis, therefore, is fairly good, and even in the most protracted cases marked mental enfeeblement is extremely rare. A favorable circumstance which is commonly noted is that these patients cease drinking. In 29 cases the authors found alcoholism of the parents in 20. Other hereditary conditions of a neurotic and psychiatric character were frequent, so that in something over 96 % of all cases a hereditary predisposition is found. The usual age for the development of this protracted alcoholic delirium is between 26 and 35. In 13 out of the 29 cases it is to be noted that disturbance of the middle and internal ear was present and seems to be associated with the development of the auditory hallucinations.

The Insane Monolog.—Darcagne¹ contributes an interesting and rather suggestive article on the subject of the insane monolog, which he insists has been very indifferently studied by alienists, and believes that it contains elements of considerable importance for the diagnosis of the mental condition, particularly being free from any of the elements which may arise to obscure the true mental state of the patient during conversation. He insists that in an automatic fashion it exteriorizes the inmost thoughts of the patient, furnishing an excellent means of observing his delirium and his real mental state. The great majority of the insane talk to themselves—some at night, some by day, and some both night and day. With some the condition is intermittent; with others it is habitual. Some use mimicry in connection with their monolog, but the majority use the singsong or monotonous tone, unaccompanied by gesture. Monolog may be considered as incoherent, logical, or illogical. There is also a form in which the patient indulges in dialog, giving expression to questions and replies or apparently repeated replies of hallucinatory voices. The general confusion of monolog is a manifestation of psychologic automatism, and every example the result of a preponderating fixed idea. In other cases it is the manifestation of an intense emotional state, and again a mere jumble of ideas, a condition Darcagne somewhat graphically describes as "l'ideorrhée." Hysterics in the major attack frequently indulge in monolog, and paralytics sometimes soliloquize, though this is rare. In general the monolog of epilepsy is brief, and in certain instances it may replace the epileptic attack, furnishing an equivalent, in which case the discourse may be somewhat prolonged. In mental confusion, if the patient indulges in monolog, it is calm, tranquil, in a low tone of voice, and sometimes incomprehensible. Occasionally the monolog is a repetition of a stereotyped conversation, as in the case of advanced paranoiacs. In other instances it is a reflex language, the expression of any exterior or interior stimulus, without apparent coherence or logical sequence.

¹ Arch. de Neurol., Dec., 1903.

Echolalia may appear in some instances. In reference to the symptomatologic value of monolog, Darcagne notes that this condition is much more frequent in chronic than in acute forms of mental alienation, and especially appears in states of dementia and chronic systematized forms of insanity, particularly in states designated secondary systematized delirium, a condition which naturally tends toward dementia. As a means of arriving at the exact mental state of the patient a study of the monolog is of undoubted importance, as ordinarily under these circumstances the patient is off his guard. In many instances it is essential to leave the patient to himself, or under conditions where he does not realize that he is overheard, particularly in those instances when the monolog is confined to the night.

Surgery of Idiocy and Insanity.—J. C. DaCosta¹ contributes a very thoughtful article on the subject of surgery of idiocy and insanity. In regard to operations for microcephalic idiocy, he expresses himself as being opposed to it except in extremely rare cases, in which there is definite evidence of early, and usually prenatal, closing of the sutures. Operations for hydrocephalic idiocy and imbecility consist in establishing drainage, and he speaks favorably of the operations of McArthur, Mikulicz, Sutherland, and Cheyne, by which some form of internal drainage is secured. Operations for epileptic insanity he would limit to those cases in which operation would be done in the absence of epilepsy or insanity. Operations for paresis are advised against. Operations for hallucinations, according to the suggestion of Burekhardt, do not meet with DaCosta's favorable consideration. The operations in traumatic insanity are those which the local conditions would indicate in the absence of insanity. Abdominal, gynecologic, and genitourinary operations on the insane are, in Da Costa's opinion, to be done only in conditions which would otherwise justify such intervention. He says: "I still believe it should not be the rule to perform operations on the abdomen, the genitourinary organs, or the nasopharynx with the hope of curing insanity, but I believe such operations should be done when the disease is of sufficient severity to call for such interference, and that in some cases the operation is sufficient to make some improvement."

The Morphin Habit.—W. S. Birge,² describing a treatment for morphin addiction, calls attention to the marked success attained in this direction by a private institution in one of the Southern States. The method is practically as follows: A careful physical examination is first made of the patient. The quantity of drug used is still continued until time for active, or 72-hour treatment, begins, but if patient is using alcoholic stimulants of any kind, they are discontinued or left off as soon as possible. The active treatment should not begin until 3 days after patient has entirely discontinued the use of alcoholics. A dose of 10 grains of calomel is given at bedtime, followed in the morning by a full dose of epsom salts. This should start up the secretions freely and completely unload the bowels. If this has not been done satisfactorily, give

¹ Jour. Nerv. and Ment. Dis., June, 1904.

² Boston M. and S. Jour., Apr. 14, 1904.

5 grains of calomel the second night, following as before by the dose of salts in the morning. In addition to the above a Turkish bath should be taken at least every second day during the preparatory treatment. When the time for the active treatment comes, the usual dose of morphin is taken up to noon of that day, when it is dropped for good and all. At 2 o'clock 5 drops of a specially prepared solution of mandragorin is given hypodermatically, together with one-eighth of a grain of pilocarpin. This dose is repeated every 2 hours. If the symptoms of abstinence manifest themselves from lack of the morphin, the dose of the mandragorin may be increased until comfort ensues, even if 15, or sometimes even 20, drops of the solution are taken. The dose of pilocarpin remains the same until the patient is brought into a profuse perspiration, and then sufficient quantity should be given to keep the skin in a continual moisture. Usually as long as the patient perspires freely he is perfectly comfortable. Birge says: "Any symptoms of abstinence that may arise can be relieved by the mandragorin. The pulse, which was stimulated and quick before beginning the treatment, usually becomes slower, but soft, full, and regular. The above treatment is continued during the 72 hours with the exception of the morning dose at 4 o'clock, which is omitted—that is, there is no medicine given between the hours of 2 and 6 in the morning. The patient is usually quiet and sleeping at this time, and it is not needed. At the beginning of the second day's treatment, or before, if there is any weakness of the heart's action, a dose of one-twentieth of a grain of strychnin nitrate and one-eighth of a grain of spartein is added to the hypodermatic solution and given every 2 or 4 hours during the remainder of the treatment. If, as occasionally happens, the patient becomes extremely restless during the treatment, a hypodermatic of one-half grain of codein, or one-quarter of morphin, may be given. This will at once quiet all restlessness and can do no harm, for the secretions are so active that it would be worked out of the system in a few hours. At the end of 48 hours the antidotal and eliminative effects of the remedies are usually complete, and there is not a vestige of morphin left in the system. This is plainly demonstrated by the fact that a dose of one-eighth or one-quarter grain of morphin would produce the same effect as it did before the addiction had been formed. During the treatment light food should be given at regular intervals. It is always taken and well assimilated, the patient even craving a larger amount of nourishment than it is well for him to take for fear of overloading the stomach and causing indigestion. After the completion of the active treatment the patient should take the hot and cold shower-bath but not enter the hot-air or vapor-bath cabinet. The strychnin nitrate and spartein should be given hypodermatically for 3 or 4 days afterward, and a good nerve tonic and sedative given for several weeks. An excellent preparation in the form of an elixir was given the patients I saw under treatment. It was composed of: R: Lactucarium, elix.; celery, elix.; hops, elix.; gentian, f. e.; wild cherry, f. e.; quassia, f. e.; spartein, sulf.; ammonia mur.; hydrastis, mur.; strophanthus, tinct.; brew; mandragora off., ext. Signa: One teaspoonful in fourth glass of water

before meals and on retiring. *Mandragora officinalis* is not a new remedy, but rather a very old one, and was supposed by the ancients to possess magical virtues, and this superstition is still cherished in some parts of Europe regarding its use. It seems to be isomeric with atropine, but is not converted into it by alkalis. The sulfate and the hydrochlorid are deliquescent or crystalline. A second alkaloid in much smaller amount was also extracted, of which the gold and platinum double chlorid were formed. Both alkaloids had a mydriatic action. *Mandragora* is the nearest thing to a specific we have in the treatment of dipsomania, and almost any case of delirium tremens may be aborted by the proper administration of this remedy."

CUTANEOUS DISEASES AND SYPHILIS.

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GENERAL SUMMARY.

In reviewing the progress in dermatology during the past year special attention is called to the advances in phototherapy and radiotherapy. Large series of cases are reported by various observers from different parts of the world to show the efficacy of these modes of treatment. It is notable to remark, under the consideration of phototherapy, the consensus of opinion regarding the inferiority of the London Hospital Lamp and similar forms of apparatus to the true Finsen method. The effect of the eosin stains in connection with the Finsen treatment is also worthy of mention. It has been shown that they increase the efficiency of the light rays. Blue-light treatment has been brought forward as a therapeutic measure and the details of the apparatus with reports of cases so treated are given. Under radiotherapy attention is called to the increased field of usefulness of the x-ray. Cases are given in detail and elaborate statistics are furnished. The results of this treatment in mycosis fungoides, hitherto incurable, are especially gratifying. The effect of idiosyncrasy in this form of treatment is a new point worthy of reference. A comparison of the results of x-ray and Finsen treatment is also given in this section. Among the newer modes of therapy practised within the year may also be mentioned exposure, high-frequency currents, and radium. The advocates of each claim most marvelous results from each. The reports from the more prominent workers along both lines are given in detail. In the section on medicinal therapeutics, the more important new remedies are described. Perhaps no more startling advance has been made than the discovery that anthropoid apes could be infected with syphilis. The results of certain experiments seem to have proved this. Other notable observations on syphilis include those on the disease in negroes, the occurrence of multiple chancres, and parasyphilitic affections. The comments on relation of syphilis to divorce, syphilis in its ethical relations, and syphilis insontium are worthy of perusal. Isolated cases of unusual interest and therapy are given in this section. Drug eruptions are considered in detail, including nearly all the reports of cutaneous disease occurring during the year that could be traced to the ingestion of medicines. Under the headings of inflammations, neoplasms, and miscellaneous are placed reports of cases of rarity and of interest. Lack of

space prevents description of the entire work of the year, and, in consequence, the contents of this section have been selected.

INFLAMMATIONS.

Tropical Cutaneous Myiasis in Man.—J. Lee Adams, Jr.¹ (Washington, D. C.), states that tropical cutaneous myiasis in man is caused by *Dermatobia noxialis*, sometimes called *Gusanopeludo* or *Muche*. Cutaneous myiasis, as a result of the deposition of eggs of the botfly, though common in animals of the temperate climate, is rare in man, but in the tropics no other disease is so common to man. He mentions the various species of the *Æstridæ* and the animals they are prone to infect and the regions affected. In man and in dog in tropical America the affection is produced by *Dermatobia noxialis* and *cyaniventris*, and the myiasis is cutaneous in character. The parasites pass through three stages: adult, larval, and pupa. The adults are heavy-bodied insects resembling the fly and the bee. The larvae are thick, fleshy grubs, living a parasitic life in the bodies of various animals. They are composed of 12 segments, more or less covered with rows of large black spines. The cephalic and caudal segments are provided with breathing-tubes. The larvae leave the host, then enter the earth, where they remain a certain length of time, and finally emerge as flies. Adams refers to the description of the larva as given by Blanchard. The method by which the parasite gains entrance to the body of its host is unknown. The most recently suggested theory, based on observations of a similar disease in cattle, is that the eggs are carried into the mouth, where they hatch; that the larvae attach themselves to the mucous membrane of the esophagus and pharynx, remaining there for a time, to disappear and wander through the tissues of the body and finally locate in the subcutaneous connective tissues. Out of 7 whites in an exploring party on the Isthmus of Darien, of which the observer was a member, 6 became hosts of the parasite and a total of 19 lesions developed. One man who never removed his clothing escaped, and another, equally averse to taking off his clothes, had but one lesion. The natives, while not entirely immune, had very few parasites. Twenty-four days after exposure in these cases parasitic tumors resembling small boils were observed on the ankle, elbow, abdomen, thigh, calf, upper arm, buttocks, and back. Most observers and victims attest the fact that the deposition of the eggs in the skin usually occurs while the individual is in bathing, although it is very doubtful whether the affected person is even aware of the exact time of the deposition. The period of incubation is from 16 to 23 days. The affection begins as one or more pinhead-sized, small, red papules which gradually increase in size for one week, at the end of which time it resembles a boil and is attended by sharp, boring nocturnal pain. The larva seldom remains in the subcutaneous connective tissue more than two and one-half weeks, and is either expelled by the patient or makes its exit spontaneously. *ment.*—As the parasite demands an abundant air-supply for its

¹ Jour. Am. Med. Assoc., Apr. 9, 1904.

this should be shut off by closing the central opening of the lesion with adhesive plaster, cotton and collodion, postage stamp, tobacco-leaf, or other means. After 24 hours the larva is asphyxiated, the plaster is taken off, and only slight pressure is necessary to cause its expulsion. Ulceration, abscess, and fatal termination, mentioned by some writers and attributed to this parasite, are due to improper treatment and are the result of forcible attempts at expulsion without previous asphyxiation of the parasite.

Protozoa in Tropical Ulcer (Aleppo Boil).—J. H. Wright,¹ in the histologic examination of a case of tropical ulcer, found bodies that were generally round, sharply defined, and two or more millimeters in diameter. These bodies were in large numbers in the smears, often occurring in aggregation associated with a large nucleus, suggesting that they have been contained in a large cell whose outlines have disappeared in the process of fixing and staining. Wright considers them protozoa and suggests the name *Helcosoma tropicum*.

Veldt Sore.—N. B. Harman² states that the "veldt sore" is usually seen as an intractable superficial ulcer edged by a fringe of exfoliating epithelium and an area of inflammatory redness. It begins as a small blister or group of blisters that rupture and leave a superficial ulcer which will not heal and exudes pus for months. Abrasions or bites of flies constitute the common mode of origin. In the bacteriologic study Harman isolated a diplococcus similar in morphology to a staphylococcus. Inoculations on his own person from cultures produced the initial blister. Curetment of the diseased area, followed by dusting with calomel, is advised in the treatment.

Blastomycetic Dermatitis.—T. C. Gilchrist³ (Baltimore) records 3 previously unpublished cases. He emphasizes the almost uniform clinical history and pathologic finding obtained in nearly all the recorded cases of this disease. Of special interest, he notes, are the systemic cases, of which there are 4 in number; one of these had probably commenced in the lungs. In all the cases there has been great similarity in the morphology of the organism as it occurs in the tissues and in the purulent exudate. No myceliums have ever been found in the tissues. From a cultural standpoint many variations have been described, some cases yielding chiefly budding forms; some mostly mycelial growths, others yielding aërial hyphas. The blood of a patient suffering from this disease will agglutinate the blastomycetes. Potassium iodid internally and exposure to the röntgen-ray constitute the treatment.

Chronic Purpuric Erythema (8 years' Duration) with Pigmentation of Skin and Enlargement of the Liver and Spleen.—W. Osler⁴ reports an unusual case of extensive cutaneous eruption, accompanied by soreness of the wrists, ankles, and knees, occurring in a man 33 years of age. The eruption had lasted several years, and involved the arms and legs. The face was free, and itching was absent. Pain, especially on motion, was present in the joints, but no swelling nor redness. When

¹ Jour. of Cutan. Dis., Jan., 1904.

² Brit. Jour. of Dermat., Jan., 1904.

³ Jour. of Cutan. Dis., Mar., 1904.

⁴ Jour. of Cutan. Dis., July, 1903.

first observed by Osler, the legs presented an almost uniform, deep-brownish pigmentation, with here and there lighter areas; widespread areas of hemorrhagic infiltration into the skin; localized and distinctly raised areas of hyperemia, and hemorrhage resembling purpura urticans, and, lastly, a general scaliness. The skin was hard and brawny to the touch. Upon the left arm, along the posterior axillary fold, were linear ecchymoses and a few spots of hemorrhage and infiltration over the biceps. The spleen and liver were enlarged. The skin improved greatly under the continuous warm bath treatment, but fresh hemorrhages occurred at intervals. Six months later the condition of the skin had changed but little. The patient died one year later of pernicious malaria.

Recurring Membranous Stomatitis Associated with Erythema Exudativum Multiforme (Hebra).—L. E. Blair¹ (Albany, N. Y.) gives an account of a case of this character occurring in a poorly nourished lad, about 12 years of age. When first observed, he had numerous irregular areas of ulceration in the mouth resembling syphilis, involving nearly one-third of the entire mucous membrane. After the stomatitis had lasted 6 days and was at its height, an erythematous eruption appeared extensively over the body, on the extensor surfaces of the extremities, back of hands, dorsum of the feet, accompanied by a severe bilateral conjunctivitis. Fever and prostration were present. The eruption soon became vesicular and then confluent; large blebs formed, resembling, for the most part, scalds. On the face the eruption was confluent, resembling variola, while on the body, in places, the blebs became hemorrhagic and pustular; some of the lesions took on the form of herpes iris. The skin eruption lasted 4 weeks, and in healing left bluish-red and afterward coppery stains, which were noticeable for months afterward, but eventually faded. On the face there was loss of skin-substance, and scarring resulted. In the mouth, the sloughing of the mucous membrane was quite marked, and white, contracted scars could be seen one year later. A second attack occurred one year after the first, a third attack one year after this; and a fourth, the most severe, about two years after the third attack. Lobar pneumonia complicated the last attack.

Erythema Scarlatiniforme (Influenzal).—J. Hamilton² records a case of influenza in which a scarlatiniform rash appeared on the body, and mentions that he has frequently observed this phenomenon. D. W. Samways,³ in commenting on Hamilton's report, adds 2 similar cases.

Atrophic Lichen Planus.—W. Reiss⁴ gives an account of a typical case of this affection occurring in a man, 21 years of age, located on the neck, thorax, and flexor surfaces of the extremities. Patches of the lesions appeared as a brownish to brownish-red network, inclosing islands of yellowish-white skin. The brownish atrophic areas presented numerous white strips, corresponding to the folds of the skin, and these strips were broken up by punctums situated at the mouth of the skin-glands and hair-follicles. Isolated flat, polygonal, shiny papules of a

¹ Med. Rec., May 7, 1904.

² Brit. Med. Jour., Apr. 23, 1904.

³ Brit. Med. Jour., Mar. 12, 1904.

⁴ Arch. f. Dermat. u. Syph., Jan., 1904.

reddish or reddish-brown color were also present. The microscope showed irregular thickening of the stratum corneum, thinning of the malpighian layer, increase of pigment in the cells of the basal layer of the epidermis and in the papillary and subpapillary layers of the corium, and round-cell infiltration of the corium.

Inoculations in Alopecia Areata.—L. Jacquet,¹ in an effort to determine the inoculability of alopecia areata, performed 100 experiments, employing for this purpose 15 patients having the disease in varying stages. Inoculations were made on this observer and 5 of his pupils, without the loss of a hair; these experiments thus disproving the affection to be parasitic in origin.

Dermatitis Herpetiformis in Children.—Meynet and Pehu² report a case of this interesting disease in a female child, 8 years of age, who was also affected with pulmonary tuberculosis. The cutaneous manifestation had first appeared about 21 months previous to the writing, and lasted one month, to recur 10 months later. The last attack was preceded by an obscure seizure, with loss of consciousness followed by a prolonged sleep. There was no herpetiform arrangement of the lesions. The urine was negative. The eosinophiles were increased and the red blood-cells were diminished during the height of the affection. From a study of this and other cases they conclude that between 6 and 10 years is the most common period for the affection in children; that males are more liable to be affected; and that no single constitutional cause can be assigned in most cases.

Pemphigus Vulgaris and Its Bacteriology.—A. C. Eustis³ (New Orleans) gives the clinical history of 2 cases of pemphigus vulgaris and concludes that in cases of pemphigus a diplococcus can be isolated from the contents of the bullas, which, when injected intravenously into the rabbit, will cause death. A diplococcus removed from the blood of the rabbit and identical with that obtained from a case of pemphigus vulgaris, when injected into the pig (*Sus scrofa*), produces in the latter animal a pustular eruption attended with mild constitutional disturbances. He also states that arsenic is the most reliable remedy in the treatment of this affection.

Acute Contagious Pemphigus in the Newborn.—G. J. Maguire⁴ (London) observed an epidemic of 18 cases of this disease in a lying-in hospital. In these cases the disease was found to be due to a pathogenic microorganism, *Staphylococcus pyogenes aureus*, conveyed from case to case by a certain midwife. The epidemic subsided when the midwife left the neighborhood. Of these 18 patients, 8 died. While occurring chiefly in the newborn, and only fatal to these, it also attacked older children and adults. It was characterized by a bullous eruption on the skin, variable in distribution and extent, the specific organism being found in the contents of the blebs. In many of the cases no symptoms other than the skin-eruption were manifested, but a certain group of cases showed grave septicæmia, general infection, and invariably

¹ La Presse méd., 1

² Amer. Med., Apr.

³ Derm. et de Syph., Dec., 1903.
 Jour. of Dermat., Dec., 1903.

ended fatally. The point at which the systemic invasion arose in these fatal cases was the unhealed umbilical scar. The treatment had little or no effect on the course and duration of the disease.

Acute Infectious Pemphigus during an Epizootic of Foot-and-mouth Disease.—J. T. Bowen¹ (Boston) describes the case of a butcher, aged 35 years, who during an epizootic of foot-and-mouth disease developed acute infectious pemphigus with febrile reaction. The affection terminated in recovery. Bacteriologic examination revealed the presence of *Staphylococcus pyogenes aureus* and *Streptococcus pyogenes*. He concludes that there is sufficient resemblance between foot-and-mouth disease and acute infectious pemphigus to warrant the belief that they belong to the same group of affections and that they may possibly be allied.

Pemphigus Vegetans.—Stanziiale² observed a case in a widow, aged 58 years. The affection was preceded by burning sensations during deglutition and exaggerated salivation. Six months later she experienced burnings in the inframammary regions, genitalia, axillas, and umbilicus. The lips became swollen, fissured, excoriated, and covered with crusts, the condition extending to the mucous membrane of the mouth and tongue. Bullas and vegetations appeared in the axillas and spread over the body. The patient died from exhaustion. Bacterial examination of the bullas revealed several microorganisms. Sir Dyce Duckworth³ (London) also records a case of this disease occurring in a man aged 51 years, of 19 months' duration. It began with a sore throat, and later his tongue, cheeks, and gums became ulcerated and painful. The affection soon became widely distributed. Induration, thickening, and pigmentation marked the sites of old lesions on the body. Ulceration, cracks, and fissures were present in some of the patches. The general health suffered greatly, and the patient succumbed to death, presumably from exhaustion, 19 months after the first manifestation.

Psoriasis of the Mucous Membrane of the Mouth.—Oppenheim⁴ gives the history of a case of generalized psoriasis in which the mucous membrane of both cheeks and of the hard and soft palate was involved, appearing as oval, bluish-white, sharply defined and elevated patches. The diagnosis was confirmed by the microscope.

NEOPLASMS.

Lupus Vulgaris.—F. H. Jacob⁵ (Nottingham, Eng.), in an attempt to work out the actual source of infection in 30 cases under his care, obtained, in 22 cases, a history of phthisis in near relatives. In 3 cases the lupus appeared while the patient was actually nursing a case of phthisis, and in one while nursing a case of hip-disease with a discharging sinus. In 3 cases lupus appeared in an infant whose parent was suffering from phthisis, and in one case the father had died a year previously from lupus. One patient habitually used the same towel as her sister,

¹ Jour. of Cutan. Dis., June, 1904.

² Ann. de Derm. et de Syph., Jan., 1904.

³ Brit. Jour. of Dermat., July, 1904.

⁴ Monats. f. prakt. Dermat., Bd. xxxvii, No. 11.

⁵ Lancet, Feb. 20, 1904.

who was suffering from lupus. In 2 cases the disease arose on the wrist of a patient suffering from phthisis. In one case it began from the margin of a wound left after excision of glands in the neck, and in 2 cases it arose from the margin of a chronic cervical abscess. In one case it occurred in the wound caused by a blow over the tibia. Six cases presented blocking-up of a nasal duct previous to the appearance of lupus, of which 4 were probed prior to the onset of this disease. W. Schiele,¹ in a detailed study of 50 cases of lupus vulgaris, examined the patients carefully in an attempt to determine the proportion of cases having tuberculosis in other organs. In 10 cases the lung was found to be involved, in 2 the joints were affected, in 1 *tabes mesenterica* was present, and in 22 there were enlarged glands. Of the cases, 5 presented no evidences of tuberculosis other than the lupus. A family history of tuberculosis was obtained in a considerable proportion of cases. Schiele considers that lupus vulgaris is either the result of an infection of the skin with tubercle bacilli from within through the lymph-stream in an individual tuberculosis elsewhere, or it is simply due to a local infection of the skin.

Multiple Lupus.—H. G. Adamson² gives an account of a case of multiple lupus occurring in a girl 5 years of age. The child had had measles 3 years before the time of examination, a feature of multiple cutaneous tuberculosis to which attention has been drawn by Dr. Castel. There was no other evidence of tuberculous disease besides the skin-lesions.

Lupus Treated with Koch's Lymph.—C. S. Bowker³ reports 7 cases of lupus in which, after thorough extirpation of the diseased tissue, injections of Koch's lymph alternated with Fowler's solution were employed. In all, the results of the treatment were extremely gratifying. The diagnosis in each had been previously rendered positive. He advises adaptation of the local treatment to meet the individual requirements. E. G. Little⁴ relates the history of a case of lupus vulgaris of the nose occurring in a boy, aged 16 years, in which injections of tuberculin were made. During the period of inoculation the condition of the nose became worse and the area of invasion seemed larger. A faintly pink follicular eruption resembling lichen scrofulosorum appeared on the abdomen and back coincidentally.

Lupus Treated by Excision.—C. H. Leaf⁵ gives an account of a case of lupus of the forehead, the right arm, and the elbow in which excision of the diseased areas was followed by extremely good results. By this case Leaf is led to believe that cases of lupus which are not too far advanced for operation can be satisfactorily treated by excision, which method has the advantage that it is more radical, it takes less time, and is less expensive than treatment by the Finsen light or röntgen-rays.

Mycosis Fungoides.—Sherwell⁶ presented before the New York Dermatological Society in March, 1904, a case of mycosis fungoides which

¹ Arch. f. Dermat. u. Syph., Dec., 1903.

² Lancet, Nov. 14, 1903.

³ Lancet, Nov. 14, 1903.

⁴ Brit.

1904.

⁵ 1904.

⁶ 1904.

he had previously considered as *parakeratosis variegata*. There were many points in its history,* however, and in the symptoms, both subjective and objective, that were atypical. J. Reid¹ (Bandon) gives the history of a case of this disease presenting several unusual features. There were marked perspirations and exudations of a serous nature from the body, together with highly fetid exhalations, notwithstanding the great care taken with the dressings. There was an almost entire absence of itching, except on the legs. Sensation was retained. The tumors were permanent. Microscopic examination showed an absence of fibrous tissue. The termination was fatal.

Röntgen-ray in Mycosis Fungoides.—D. M. Greig² gives an account of a case of mycosis fungoides in which the röntgen-ray was applied to one of the ulcerated areas that had been previously subjected to excision, with marked improvement after 9 exposures. The patient subsequently died of what appeared to be cerebrospinal involvement, possibly some special form of meningitis. A. E. Carrier³ gives an account of a case of this character occurring in a man, 75 years of age, in which exposure to the röntgen-ray had effected apparent cure. The duration of the disease was 12 years. Three months after the first röntgen-ray treatment there was present no evidence of the disease (with the exception of the pigment in the sites of the larger tumors), no induration, no scaling, no tumors, and no pruritus. The röntgen-ray was not combined with other treatment, but was used alone.

Sarcomatosis Cutis.—J. C. Wilson and F. J. Kalteyer⁴ (Philadelphia) record a case of sarcomatosis cutis occurring in a young married woman, aged 26 years. The distinctive features of the case may be tabulated as follows: Pigmented mole upon the forehead; rapid growth after injury, with great vascularity; removal by operation, followed by the formation of a scar; the appearance, about the time of the operation and shortly afterward, of disseminated nodules, which were shown to be sarcomatous by the microscope, in the skin and subcutaneous tissues; rapid, irregular enlargement of the liver; enlargement of the spleen; rapid wasting; fatal termination.

Treatment of Epithelioma with the Röntgen-ray.—D. W. Montgomery⁵ (San Francisco, Cal.), after an extensive experience with this method of therapy, reaches the following conclusions: The röntgen-ray may be used when pain is particularly to be avoided, as in old, feeble people, or when a good cosmetic effect is particularly desirable. It may be used when the patient is so situated that he can afford a long course of treatment, and when the course of the disease is so slow as to allow one almost to neglect the element of time. It will cure over 50 % of epitheliomas of the face, and will diminish the size of the lesion in a very much greater number. Granting only the latter property, his experience has been that cure is often completed by a subsequent slight curetting and cauterization. He advises its employment as an adjunct after every operation for cancer.

¹ Brit. Med. Jour., Feb. 27, 1904.

² Brit. Jour. of Dermat., July, 1904.

³ Jour. of Cutan. Dis., Feb., 1904.

⁴ Am. Jour. Med. Sci., Nov., 1903.

⁵ Canadian Practitioner and Review, Apr., 1904.

Rodent Ulcer Occurring on the Arm.—W. McMurray¹ (Sydney, Australia) reports a case of rodent ulcer occurring on the outer side of the right arm in a healthy-looking woman aged 62 years. The lesion had begun 9 years previous as a "spongy blood wart" with a flat top, brownish-red in color, firm to touch, the surface of which became abraded and a scab formed. This gradually broke down, discharging a thin, watery fluid. Apart from its infrequent location the lesion presents no unusual features.

Rodent Ulcer Treated with Röntgen-rays.—G. G. S. Taylor² (Liverpool) describes a case of rodent ulcer occurring on the face of a woman, aged 51 years, in which exposure to the röntgen-ray over an extended period effected an apparent cure. Unfortunately, none of the diseased structure was submitted to microscopic examination.

Paget's Disease of the Umbilicus.—T. C. Fox and J. M. H. Macleod³ give an account of a case of Paget's disease involving the umbilicus in a man, aged 65 years, of good constitution and without any family history of cancer. In the umbilical region was a rounded, eczematous patch about 2 inches in diameter, which had been gradually forming for about 11 years. The central part of the patch was a bright red color, with small spots of white epithelium with ulcerations, between which exuded serum; the border was smooth and elevated, the whole patch feeling infiltrated. The diagnosis was confirmed by histologic examination.

Treatment of Multiple Warts by the Internal Use of Magnesium Salts.—A. Hall⁴ (Sheffield), acting on the suggestion of Colrat, of Lyons, administered a preparation of magnesium sulfate (magnesium sulfate 1 dram, magnesium carbonate 15 grains, spirits of chloroform and peppermint-water) in a case of multiple warts, with total disappearance of the same within 18 days. This phenomenon suggests to Hall that these warts are due to some poor parasite, the growth of which is readily prevented by some very slight alteration in the soil, such as might be induced by this kind of internal treatment.

Papilloma of the Sole.—D. W. Montgomery⁵ (San Francisco, Cal.) records the histories of 7 cases of this unusual affection under his own observation. While traumatism is usually given as a cause, in none of these cases was there such a history. In 3 of the cases there was eczema, in 1 of them herpes, and in 1 hyperidrosis. All these seem to indicate an irritable state of the skin favorable to the development of papillomas, but it is noteworthy that there were no warts found on any other part of the surface in these cases. In treatment, he suggests first softening the hard epidermal covering so as to expose the part to any treatment applicable to cutaneous warts elsewhere.

Molluscum fibrosum of the skin associated with a similar condition of the rectum is reported by A. B. Cooke⁶ (Nashville, Tenn.). The patient was a white male, aged 43 years, and had first noticed the rectal condition when 13 years old. The skin manifestations began to

¹ Australia Med. Gaz., May 20, 1904.

² Brit. Jour. of Dermat., Feb., 1904.

³ Jour. Am. Med. Assoc., July 11, 1903.

⁴ Brit.

⁵ Brit.

⁶ Ar

appear when the patient was 19 years of age. The rectal and some of the cutaneous growths were removed and examined microscopically. The examination confirmed the diagnosis of molluscum fibrosum.

DRUG ERUPTIONS.

Leukonychia Striata Arsenicalis Transversus.—Chas. J. Aldrich¹ (Cleveland, Ohio) reports 3 cases of this very interesting affection. The first case was that of a woman with a severe arsenical neuritis, in whom the condition was clearly traced to a large dose of an arsenical preparation ("Rough on Rats") taken with suicidal intent. The white streaks were about one-sixteenth of an inch in width, quite regular, with fairly sharp margins, occupying an identical position (middle of the outer third) on each nail. They varied in size on different nails, and were a little wider in the center than near the margins; extended from side to side, forming



Fig. 5.—Leukonychia Striata Arsenicalis Transversus (Aldrich, in Am. Jour. Med. Sci., Apr., 1904).

a crescentic band, with the convexity directed to the free margins of the nail, and presenting a curve identical with that of the lunula. The markings were seen on the toe-nails, but to a less extent. The second case occurred in a man suffering from multiple neuritis also traceable to a single large dose of arsenic. Inspection of his nails showed the characteristic transverse streaks, such as just described. The third case was that of a rather young man who had taken an arsenical preparation ("Rough on Rats") with suicidal intent. The usual sequels of arsenical poisoning occurred. A white, slightly crescentic, transverse streak with the convexity of the crescent directed toward the free margin appeared on each nail (Fig. 5). The toe-nails also showed faint markings. Aldrich states that it is possible that careful observation will show that these peculiar markings on the nails quite constantly follow severe acute arsenical poisoning, and he believes they depend upon the serious alteration in

¹ Am. Jour. Med. Sci., Apr., 1904.

the nutrition incident to the profound shock of the poisoning, aided, perhaps, by the specific effect of the arsenic.

Proprietary Drug Eruptions.—J. J. Pickles¹ gives an account of an erythematous eruption with rise of temperature following the use of a proprietary preparation known as "Doan's Backache Pills." The same preparation was responsible for the production of an erythematous eruption resembling scarlatina in the case of a lad 17 years old, described by G. W. R. Skene. The duration was short in both cases.

Antimonial and Lead Poisoning Resulting from the Use of the Linotype.—L. Roberts² (Liverpool) gives an account of a case of poisoning occurring in a compositor, aged 29 years, characterized by hyperidrosis of the palms, soles, and head; smooth flat papules on the hands; tenderness on pressure of the palms and soles; trembling of the muscles of the upper extremities; chronic constipation; absence of colic, vomiting, or other evidence of intestinal disturbance; and the presence of lead in the urine. The condition resembled arsenical poisoning, but careful inquiry elicited the information that the linotype metal consisted only of tin, antimony, and lead. The condition was, therefore, one of poisoning by lead and antimony, the action of the latter on the epithelium being identical with that of arsenic.

Mesotan Eruption.—C. Berliner³ reports a case of a cutaneous eruption following the external and internal use of mesotan, prescribed for a painful shoulder-joint. The eruption consisted of irregular, elevated patches of varying size and shape, of a bright red color, separated by areas of normal skin. This erysipelas-like redness extended over the right shoulder to the chest, back, axilla, and wrist. The left shoulder, which had had one application, was affected with a lichen-like eruption. There was no rise of temperature. The eruption did not entirely subside with the withdrawal of the drug, and from this Berliner concludes that it was due, in part, to the slow assimilation and elimination of the drug when taken internally.

Reflex Skin-eruptions from Morbid Alterations of the Male Urethra.—A. Ravogli⁴ (Cincinnati) states that a diseased condition of the urethra is often the cause of reflex skin-eruptions, especially herpes and pruritus. He has adopted the system of making a thorough examination of the urethra, and from a large number of patients who have applied for treatment of herpes progenitalis, he has found in every case a condition of chronic posterior urethritis. The cause of pruritus in the genital and anal region must also, he believes, be looked for in the condition of the urethra, especially the prostatic region. The major portion of the treatment should consequently be directed toward the urethral condition.

Tuberous Iodid of Potassium Eruption Simulating, Histologically, Epithelioma.—D. W. Monte⁵ reports a case in which, after

¹ Brit. Med. Jour., Dec

² Brit. Jour. of Derm^{at}

³ Monats. f. prakt. De

⁴ Med. News, Dec. 26

Dis., Feb., 1904.

the injection of large doses of potassium iodid, there appeared an eruption of tumor-like and papillary elevations scattered over the scalp, face, trunk, and extremities, accompanied by elevation of temperature and evidence of renal insufficiency. One of the most prominent lesions, situated on the forehead over the left eye, was a soft, rounded tumor the size of a quarter-dollar, with a broad, constricted base and ulcerating summit. A portion of this tumor, when examined microscopically, showed a structure closely resembling epithelioma.

Papular Exudative Dermatitis Provoked by Pilocarpin.—B. Hallopeau and Viellard,¹ in a paper on this subject, conclude that the prolonged use of pilocarpin introduced into the organism, hypodermatically or by ocular instillations, sometimes produces an eruption of umbilicated papules which are localized in the sudoriparous glands, particularly of the face and extremities. The exudate in these lesions may be serous or purulent. This eruption differs in its clinical characteristics from all dermatoses heretofore described; it is apyretic, and is accompanied by grave disturbances of the general health, particularly in the invasion of the heart. These observers found no known antidote for pilocarpin, elimination being the only means of effacing its effects.

Acute Dermatitis Produced by Satin-wood Irritation.—H. E. Jones² (Ibrox) gives an interesting account of an epidemic of acute dermatitis occurring in the employees of a certain shipbuilding-yard in which satin-wood was used extensively. The disease presented no unusual features apart from its peculiar cause.

Urticaria from the Local Application of Suprarenal Extract.—A. Rosenberg³ observed a case in which the local application of suprarenal extract to swollen inferior turbinates was followed immediately by disturbance of smell and within a few hours by a diffuse urticaria extending over the trunk and arms. This disappeared shortly but reappeared when the local treatment was repeated.

Infantile Urticaria due to Ingestion of Egg-albumin.—B. Bendie⁴ gives an account of a case of a child, 13 months old, in which acute urticaria with edematous swelling of parts of the face invariably followed the ingestion of an egg. On 3 occasions it was found that the urticarial reaction followed the administration of an egg in 5, 7, and 8 minutes, respectively. The local application of egg-albumin to the skin did not provoke the condition, nor did the ingestion of meat or milk-albumin.

Infectious Dermatitis in Chronic Morphinism.—P. H. Lyon and W. B. Wherry⁵ (Philippine Islands) record an interesting case of infectious dermatitis in a convict Chinaman, located on the chest, anterior aspect of both arms, both thighs, and the right leg. In places scales had accumulated, forming horny projections fully 1 inch in height, extending over an enormous area. Beneath these scales were ulcerated surfaces, giving off a peculiarly foul-smelling pus. Pain was present. The patient was emaciated and unable to eat or sleep. He was addicted to

¹ Ann. de Derm. et de Syph., May, 1904.

² Brit. Med. Jour., June 25, 1904.

³ Berl. klin. Woch., Oct. 12, 1903.

⁴ Deut. Aerzt. Zeit., Jan., 1904.

⁵ Amer. Med., Sept. 5, 1903.

the use of morphin, which he administered frequently to himself hypodermatically. The skin manifestation began as a pimple, probably at the site of one of the injections. With tonic and antiseptic treatment, withholding the morphin, the affection underwent resolution. Bacteriologic examination showed the presence of numerous kidney-shaped diplococci resembling gonococci. Inquiry among the Chinese known to be users of the drug brought out the fact that there are in Manila, at the present time, a number of persons suffering from a similar condition induced in a like manner. In many cases persons living in the same house and indulging in this vicious habit will all be affected alike.

Mercurial Exanthems.—Tomaszewski,¹ in a recent paper, discusses the true mercurial exanthems, which are to be distinguished from the ordinary acne mercurialis of the hairy surfaces and the fugitive mercurial dermatitis most common in the axillas and groins, both of which are associated with the local application of the drug. The true mercurial exanthem may occur after the administration of the drug in any form. The eruption in these cases is varied, and no fewer than 7 types may occur. This observer cites cases resembling measles, scarlet fever, purpura hæmorrhagica, and erysipelas, erythematous and urticarial eruptions, and eruptions simulating pemphigus vulgaris. The urticarial eruptions and those resembling scarlet fever are fairly common, the other forms rather rare. He lays great stress on the general tendency in mercurial eruptions to extensive desquamation and the peculiar violet-red color of the lesions. These eruptions disappear when the drug is discontinued, to recur with the subsequent administration of the mercury.

MISCELLANEOUS.

Visceral Manifestations of the Erythema Group of Skin Diseases.

—W. Osler² adds 11 cases to his 18 previously reported cases in which a relation between visceral conditions and erythematous affections was shown to exist. In his 11 recent cases 3 deaths occurred—2 from uremia, 1 from meningitis secondary to otitis media. In 7 cases marked evidences of kidney involvement were present. The skin manifestations were erythematous, purpuric, and urticarial, frequently in varying grades of combination. In the entire series of 29 cases there were 7 deaths. In commenting on the relation of the erythemas to general pathologic processes he states that certain types of exudative erythema resemble an acute febrile disease. In many of the fevers—typhoid, pneumonia, rheumatic fever, etc.—there may be symptomatic erythemas. The more severe forms of purpura urticans with arthritis and colic (Henoch's purpura and peliosis rheumatica) may run an acute febrile course with heart complications. Many of the graver cases of purpura, he states, have followed an acute infection, puerperal fever, gonorrhea, etc. The rheumatic poison is probably responsible for very many cases. In a very long period of time it persists for so many years that an infective

Am. Med. Assoc., Mar. 12, 1904.
Sci., Jan., 1904.

process is not to be considered. In these the visceral lesions are most diverse in situations and form, and vary with the character of the eruptions. It should be borne in mind that certain skin-lesions are associated secondarily with diseases of the internal organs. Purpura of a severe type is very common in Bright's disease; urticaria and purpura in cirrhosis of the liver and cholelithiasis; urticaria in asthma and all forms of erythema with the chronic valvular lesions of the heart in children. It is not always easy to determine which is primary—the internal or the external condition. The complications form 2 great groups—the angio-neurotic and the inflammatory. To the former belong the swellings of the fauces, the edema of the glottis, the changes in the bronchial mucosa, causing asthma, and the colic; to the latter the more serious complications, endocarditis, pericarditis, pleurisy, pneumonia, and nephritis. In conclusion he states that in these cases the chief danger is from kidney complications, and emphasizes the necessity of its early recognition and prompt treatment by protracted rest and a milk diet.

Histologic Changes of Leukokeratosis Buccalis Compared with Tylosis Palmæ et Plantæ.—S. Rosenheim¹ found, upon microscopic examination of a section of the cheek affected with leukokeratosis buccalis, that there is an extreme thickness of both mucous membrane and sub-mucosa, and that there is present a new layer,—a very thick horny layer,—just as in the skin, but much thicker. The mucous membrane of the patch consists of the outer, horny layer and the inner layer, the malpighian layer. Nuclei are not seen in the outer layer. The malpighian layer is much thickened and shows well-defined nuclei and nucleoli. The latter become less distinct as the horny layers approach. The sub-mucosa is very strongly infiltrated with round-cells about the vessels and just under the epidermis. In tylosis palmæ and plantæ the microscopic appearances were as follows: First, the stratum mucosum somewhat thickened; the stratum granulosum has large, distinctly stained granules; the papillæ are somewhat numerous and extend deep into the mucous layer. About the vessels are a few round-cells. The essential changes in both of these diseases are very much alike—namely, the process of keratinization resulting in one case in the formation of a new layer and in the other a great increase in the thickness of the horny layer and infiltration in the corium of young round-cells.

Developmental Defects of the Skin and Their Malignant Growths.

—H. G. Anthony² (Chicago), in a paper with this title, considers the causes of developmental defects of the skin and the malignant growths that may arise from them. In his opinion the word nevus should be used simply as a term of clinical convenience to designate any mark on the skin present at birth or developing shortly afterward, regardless of its histologic structure and without any attempt at scientific accuracy. To avoid confusion of nomenclature and misuse of the word nevus he suggests that it would be advantageous to employ the expression “developmental defects of the skin” to designate all abnormal conditions

¹ Johns Hopkins Hosp. Bull., Feb., 1904.

² Jour. Am. Med. Assoc., June 18, 1904.

of intrauterine origin which are not due to disease of the skin. There are 2 classes of developmental defects—misplacements and anomalies of development. In the latter class are placed anomalies of hair and nails, of keratinization, of pigmentation, of blood-vessels, of fibrous tissue, etc. The causes of defective development are numerous, but heredity and the toxins of the chronic infectious fevers he believes to be the most potent. In discussing the displacements he states that those of greatest importance are those which are formed by the glandular elements of the skin and the pigmentary mole. The histology of the pigmentary mole is considered at length, and the Cohnheim theory of its production is accepted by this observer. The various malignant changes, epithelioma, melanosarcoma, sarcoma, etc., that may occur in these defects are enumerated. It is suggested that the most common growth is entitled to separate classification, since it differs from carcinoma both clinically and pathologically. It develops in displaced embryonic tissue, which is probably of epithelium origin, and it should be classified separately and apart from all other malignant growths under the term "melanoma."

Seborrhœa Nigrans (Black Mask of the Face).—A. Van Harlingen¹ (Philadelphia) records a case of this character occurring in a hysteric female, 23 years of age, belonging to a neurotic family. She had been bedridden for 4 years, and although somewhat emaciated, she did not seem particularly ill. Shortly after taking to bed a discoloration began to appear upon the face, which gradually spread and grew deeper in color until the entire visage was covered with a thick black mask (Fig. 6). The skin of the face was dry and scaly. The lips were dry, and the skin immediately circum-



Fig. 6.—Seborrhœa nigrans (Van Harlingen, in Am. Jour. Med. Sci., Feb., 1904).

adjacent covered with yellowish sordes or crust, vesicular or seborrhœic in character, surrounding the mouth. This was said to pursue a course of several weeks, turning black and falling off, to be succeeded by a fresh outbreak. When seen by this observer the forehead and nose were covered with a mask or crust, exceeding a quarter of an inch in thickness, resembling a rind of ham—soft, greasy, sharply defined about the edges, and round. It could be easily broken off, and the color, exteriorly, was inky black, and the surface smooth, presenting an appearance as though a mask or visard were worn over the upper part of the face. It was eventually softened by applications of green soap and removed. The internal surface was of a whitish color, soft and very greasy, showing numerous conic elevations corresponding to the

¹ Am. Jour.

1904.

openings of the glands. The removal was not painful. The patient's general condition was that of a hysteric individual. The local condition did not recur. Van Harlingen concludes that this case was one of oily seborrhea, with a dusky secretion upon the surface, which, by reason of long-continued neglect, had been allowed to accumulate for years.

Black, Hairy Tongue.—R. H. Johnston¹ (Baltimore) reports a case of this character occurring in a man, aged 56, in perfect health. He consulted Johnston on account of a peculiar sticking sensation in the mouth and blackness of the tongue, which condition up to this time had lasted about 2 months. On inspection an almost round, black discoloration, measuring about 10 mm. in each diameter and situated in front of the circumvallate papillas in the center of the tongue, was observed. The black area was seen to be covered with hairs about half an inch in length, which on microscopic examination were found to consist of hornified epithelium, one cell upon the other. Further observation was impossible owing to the failure on the part of the patient to return. Middlemass Hunt (London) recently exhibited before a local society another case of the same condition in a man, 60 years old. The patch was discovered accidentally and gradually spread until the posterior half of the dorsum was nearly covered with the long, soft, black hairs characteristic of the disease. An attempt to cultivate the parasite described by Schmiegelow and others had not been successful.

Eosinophilia in Skin Diseases.—H. S. French² gives a long list of the records of actual blood-counts in various skin diseases, taking the figures from the original papers of many different observers. In this list there are 69 patients with skin diseases, but only 21 show eosinophilia; 3 out of 8 with eczema; 3 out of 10 with lupus vulgaris; 1 out of 5 with measles; 4 out of 6 with pemphigus; 3 out of 4 with psoriasis; 2 out of 9 with scarlet fever; 2 out of 3 with scleroderma; 2 out of 13 with syphilis; and none at all with acne vulgaris, cutaneous burns, erythema from salol, erythema multiforme, herpes zoster, lichen ruber planus, chronic urticaria. The only cases in which it was marked—6 in all—were 1 case out of 8 with eczema; 1 out of 10 with lupus vulgaris; 3 out of 6 with pemphigus; and 1 out of 4 with psoriasis. In a personal investigation the blood of 90 patients was examined, and eosinophilia was found to be present in 13 cases, but was only well-marked in 4 of these. Eosinophilia was absent in the parasitic skin diseases. These observations seem to show that eosinophilia is scarcely a common characteristic of skin diseases in general, and that, in the few cases in which it is found, the changes in the blood may be due to some cause other than the skin affection. Lymphocytosis was not found to be constant in individuals suffering from any other form of skin disease except urticaria.

Lymphatic Leukemia with Purpura.—F. C. Shattuck³ (Boston) describes a case of lymphatic leukemia occurring in a man, aged 20 years, associated with a papular, vesicular, and macular eruption with old and new hemorrhages into the skin. The rash was first localized on the

¹ N. Y. Med. Jour., July 18, 1903.

² Birmingham Med. Rev., Mar., 1904.

³ Jour. of Cutan. Dis., Mar., 1904.

extensor surfaces of the forearms, but gradually became generalized. The patient died after an illness of only 9 weeks.

Larva Migrans.—H. W. Stelwagon¹ (Philadelphia) gives an account of a case of this interesting affection occurring as a burrow on the leg of a boy, aged 9 years, consisting of a somewhat irregular, tortuous, erythematous, erythematopapular, and papulovesicular line some inches in length, and varying from $\frac{1}{8}$ to $\frac{1}{2}$ of an inch in width, and of about the same varying elevation above the surface. The line was least marked, and, indeed, scarcely perceptible, at the extending end; more marked on the recently traversed part, and gradually became less noticeable and fading where the track had first been made. The treatment consisted in the internal administration of asafetida (Van Harlingen's method) and a cataphoretic application of corrosive sublimate made and supplemented by a minute application of nitric acid over the suspected lair of the parasite. It appeared to be successful.

Acanthosis Nigrans.—O. Hess² states that the chief symptoms of this rare skin-disease are the typical location, the hypertrophy of the dermal papillas, and the increase of pigment. A distinct discoloration and furrowing will develop symmetrically upon the neck, breasts, navel, inguinal region, arms, genitocrural fold, axilla, elbow, hand, and foot, which will progress until areas are studded with simple or branched papillomatous elevations. The mucous membranes become covered with pale or red papillary proliferations which frequently pain considerably. The course is progressive in some cases; the onset is marked by itching. Severe lesions of the internal organs, usually carcinomatous, often terminate this peculiar disease, for which there is as yet no satisfactory explanation. The treatment is symptomatic, yet in one case a cure is reported after a hysterectomy for malignant deciduoma.

Pruritus.—Brocq³ gives the following combinations as of value in the treatment of pruritus:

R. Resorcin gr. iv (0.25 gm.)
Hydrarg. chlorid. mitis gr. xij (0.75 gm.)
Zinci oxidi gr. xxx (2.00 gm.)
Petrolatum 5v (20.00 gm.)

M. Ft. unguentum.

Sig.—Apply locally.

R. Menthol gr. iij (0.20 gm.)
Acidi carbolic. gr. iv (0.25 gm.)
Acidi salicyli 5ss (2.00 gm.)
Zinci oxidi 5iiss (6.00 gm.)
Liq. petrolat. 3j (30.00 gm.)

M. Ft. unguentum.

Sig.—Apply locally to the affected part.

In pruritus of the vulva Verchère⁴ recommends the following:

R. Hydrarg. bichlorid. gr. xv (1 gm.)
Alcoholis 5j (4 gm.)
Aque rosæ 5v (20 gm.)
Aque destil. 3vj (180 gm.)

M. Ft. lotio.

Sig.—Apply locally twice daily.

¹ Jour. of Cutan. Dis., Nov., 1903. ² Abstr. Med. News, Nov. 14, 1903.

³ Abstr. Jour. Am. Med. Assoc., Oct. 17, 1903.

⁴ Abstr. Jour. Am. Med. Assoc., Oct. 17, 1903.

A. Robin¹ advises the following formulas for the relief of the foregoing condition:

- R. Spts. chloroformi..... $\overline{3}$ ij (8 gm.)
 Olei amygdalæ dulc..... $\overline{3}$ ij (60 gm.)
 M. Sig.—Apply locally. Or:
 R. Hydrarg. bichlorid..... \overline{aa} gr. ij (0.12 gm.)
 Emuls. amygdalæ..... $\overline{3}$ vj (180.00 gm.)
 M. Sig.—Use as a local application. Or:
 R. Orthoformi
 Diiodoformi
 Talc..... \overline{aa} $\overline{3}$ ij (8 gm.)
 M. Ft. pulvis.
 Sig.—Apply locally. Or:
 R. Menthol.....gr. $\frac{1}{4}$ (0.05 gm.)
 Guaiacol.....gr. viiss (0.50 gm.)
 Zinci oxidi..... $\overline{3}$ iiss (10.00 gm.)
 Liq. petrolati..... $\overline{3}$ j (30.00 gm.)
 M. Ft. unguentum.
 Sig.—Apply locally.

In pruritus arising from aural eczema Lichtenstein² recommends ointments in preference to lotions, among which the following may be mentioned:

- R. Pulv. amyli
 Pulv. zinci oxidi..... \overline{aa} $\overline{3}$ ij (8 gm.)
 Petrolat..... $\overline{3}$ ss (15 gm.)
 M. Sig.—Lassar's paste. Apply locally.
 R. Olei cadini..... $\overline{3}$ ss (2 gm.)
 Liq. petrolat..... $\overline{3}$ v (20 gm.)
 M. Ft. unguentum.
 Sig.—Apply locally.
 R. Hydrarg. oxidi flav.....gr. xv (1 gm.)
 Liq. petrolati..... $\overline{3}$ iv (15 gm.)
 M. Ft. unguentum.
 Sig.—Apply locally.

Bronson³ employs carbolic acid in the following combination:

- R. Acid. carbol..... $\overline{3}$ j-ij (4-8 gm.)
 Liq. potass..... $\overline{3}$ j (4 gm.)
 Olei. lini..... $\overline{3}$ j (30 gm.)
 M. Sig.—Apply locally.

Pruritus in Children.—M. de Castle⁴ observes that general pruritus occurring in children rapidly subsides on the internal administration of lactic acid. He advises giving it in doses of fifteen minims (1.00) daily. In very small children he recommends doses of 10 to 15 minims (0.65 to 1.0) of a 1 % solution in divided doses during the 24 hours.

Localized Pruritus.—Hofmeister⁵ recommends the following:

- R. Potass. bromid.
 Lupulin..... \overline{aa} gr. xxx (2 gm.)
 Hydrarg. chlorid. mit..... $\overline{3}$ v (20 gm.)
 Olei olivæ..... $\overline{3}$ iiss (10 gm.)
 M. Sig.—Shake well and apply.

¹ Abstr. Jour. Am. Med. Assoc., Oct. 17, 1903.

² Abstr. Jour. Am. Med. Assoc., Oct. 17, 1903.

³ Abstr. Jour. Am. Med. Assoc., Oct. 17, 1904.

⁴ Jour. Am. Med. Assoc., Nov. 7, 1903.

⁵ Revue française de médecine et de chirurgie, July 27, 1903.

Anal or Scrotal Pruritus.—Allingham¹ advises in anal pruritus the introduction of a cone of ivory or bone into the rectum, which is maintained in position by a suitable dressing. In scrotal pruritus Vidal advises scarification and Berger used dilute solutions of the hypochlorites. In anal pruritus due to oxyuria Liveing employs the following ointments:

- R. Ung. hydrarg.
Vaselin.....āā 3ss (15 gm.)
M. Sig.—Apply locally.
R. Hydrarg. chlorid. mit.gr. xlv (3 gm.)
Lanolin3viiss (30 gm.)
M. Sig.—Apply locally.
R. Cocain.gr. xv (1 gm.)
Bismuth. subnit.....gr. xxx (2 gm.)
Lanolin3v (20 gm.)
M. Sig.—Apply locally.

For anal pruritus with hemorrhoids:

- R. Ext. hamamelis fluid.....3viiss (30.0 gm.)
Ext. hydrastis
Ergotināā 3xv (60.0 gm.)
Tinct. benzoin.....3xv (60.0 gm.)
Olei olivæ3viiss
Acid. carbol.gr. xxiiss (1.5 gm.)
M. Sig.—For external use.

The following are also recommended for pruritus in the same journal:

- R. Sodii sulphocarbolat.3ij (8 gm.)
Vaselin
Lanolin3xi½ (45 gm.)
M. Ft. ung.
Sig.—Apply locally.
R. Acid. carbol.gr. xc (6 gm.)
Soda lye.....3j (4 gm.)
Olei lini3j (30 gm.)
Olei bergamot.....q. s.
M. Ft. ung.
Sig.—Apply locally.
R. Targr. cl (10 gm.)
Benzol.3v (4 gm.)
Acetone3ij (70 gm.)
M. Ft. ung.
Sig.—Apply locally.

The following are recommended in the "Centralblatt für die gesammte Therapie," July, 1903:

- R. Ammonii chlorat.
Hydrarg. chlorid. corrosiv...āā gr. xxx (0.20 gm.)
Aq. amygdal.....q. s. ad 3xvj-gr. xxxvj (500.00 gm.)
M. Sig.—Apply every 2 hours.
R. Chloral. hydrat.....gr. cl (10.00 gm.)
Aq. font.....q. s. ad 3xvj-gr. xxxvj (500.00 gm.)
M. Sig.—Saturate a compress and apply at night.

Senile Pruritus.—Gaucher² advises the elimination of nitrogenous foods from the diet and the use of milk and vegetables in pruritus of the aged, in addition to local applications. He uses the following:

- R. Guaiacol
Mentholāā 3v (20 gm.)
Vaselin3iii½ (100 gm.)
M. Ft. ung.
Sig.—Apply locally.

¹ Tribune medicale, Aug. 1, 1903.

² Jour. de medicine interne, Dec. 15, 1903.

If a thicker ointment is desired, zinc oxid ointment may be used as a base. A 2 % powder of talcum and camphor is used subsequently.

SYPHILIS.

The Diagnosis of Cutaneous Syphilis ex Juvantibus.—M. B. Hartzell,¹ in an editorial relative to this subject, deplors the general acceptance of improvement in syphilis under the administration of the iodids as a diagnostic sign. He refers to a number of recorded observations of benefit in actinomycosis and blastomycosis cutis, and of one case of multiple mycotic abscess cured by the use of potassium iodid. He further remarks that it is not safe to conclude that because a lesion of the skin shows decided improvement after the employment of some one of the iodids, it must necessarily be syphilis.

Differential Diagnosis between Syphilis and Drug Eruptions.—C. Berliner² emphasizes the necessity of distinguishing the eruptions produced by the ingestion of the iodids, bromids, antipyrin, and similar drugs, from the cutaneous manifestations of syphilis. He advises, in all eruptions of acute origin, making inquiry as to the food-products and drugs having this tendency, and remarks that acute onset, itching, burning, fever, etc., are uncommon in syphilitic eruptions. In doubtful cases the patient should be placed on absolute diet for a short time, during which nonsyphilitic eruptions will disappear if due to drugs or food.

Origin of the Pigmentary Syphilid of the Neck.—Hullen³ concludes from his observations that a secondary eruption occurs on the neck more frequently than is generally supposed; that the pigmentary syphilid follows a previous macular or papular eruption accompanied by hypervascularization, which, on disappearing, leaves in its place white zones (cicatrices, atrophy, or loss of pigment); that the pigmented network ("lace collar") is simply due to the fact that it occurs in a part of the body where there is a natural tendency to pigmentation, and that the latter must be considered an expression of defense against the syphilitic virus.

A Case of Reinfection of Syphilis.—H. G. Klotz⁴ (New York city) gives the history of an adult male who, 6 years after having been afflicted with undoubted gummatous infiltration of the bones of the chest and other manifestations of tertiary syphilis, developed a typical primary lesion on the prepuce, a little over a week after exposure by sexual intercourse. About 5 weeks later pains in the throat and chest, sleeplessness, headache, and a maculopapular eruption on the face and trunk became manifest. These symptoms disappeared under the administration of antisymphilitic treatment.

Syphilis in Anthropoid Apes.—Metchnikoff and Roux⁵ inoculated a female chimpanzee with syphilitic virus and 25 days later a hard sore developed which was considered by Fournier and others as of syphilitic

¹ Amer. Med., Apr. 2, 1904. ² Monatsh. f. prakt. Dermat., Bd. xxxv, S. 17.

³ Abstr. Jour. of Cutan. Dis., Mar., 1904. ⁴ Jour. of Cutan. Dis., July 28, 1904.

⁵ Deut. med. Woch., 1903, No. 50, p. 943.

nature. A month later about 15 papules appeared on various parts of the body, and remained until the death of the animal through pneumococcus infection 14 days after the inoculation. A second chimpanzee was inoculated in the penis and thigh from the subsiding chancre of the first animal, and 35 days later an erosion, which later ulcerated, appeared on the penis and on the thigh. The lesion was indurated, and the neighboring lymph-glands were enlarged. This animal also died, presumably from influenza infection.

Syphilis in the Negro.—F. Jones¹ (Memphis, Tenn.) states that syphilis obtains in all of its forms in its most classic type in the negro by reason of his habits, his environments, his utter indifference to disease, and his carelessness and delay in having it treated. The precocity of syphilis in the negro is striking. Fulminating or acute syphilis is not uncommon. He believes the prevalence and high mortality of phthisis in southern negroes can be traced to the damage that has been previously wrought by syphilis. Reference is also made to the frequency of syphilitic accumulations on the pleura. Concerning cardiac syphilis, he believes that acute syphilis produces pronounced acute endocarditis, from which lesions, both valvular and muscular, may arise in all their classic stages and their most severe forms. In negroes he finds a clear history of syphilis in heart affections more often than of inflammatory rheumatism. He also notes the prevalence of syphilitic stricture of the rectum in female negroes. He has found that the proctitis from which the stricture resulted in the majority of cases developed early along with the secondary eruption.

Multiplicity of Syphilitic Chancres.—M. Ineyrat,² in 500 cases of recent syphilitic chancre, observed 131 cases of multiple chancres, of which he found 2 chancres 79 times; 3, 27 times; 4, 6 times; 5, 12 times; 6, twice; 7, 3 times; 12, once, and 13, once.

Inherited Syphilis.—G. F. Suker³ (Chicago), in a description of a case of inherited syphilis, refers to the unusual dental manifestation known as the "Darier-Hutchinson" molar. The first molar presents the same alterations as the classic canines and incisors. This molar has 4 little tubercles of dentin, one at each cusp of the tooth. The enamel at this point is wanting. The tooth has, as it were, 4 yellowish prongs of dentin. This observer states that this marking of the molar is as characteristic of inherited syphilis as any other dental lesion.

Influence of Alcohol in Syphilis.—Yahza-Mirza⁴ states that while syphilis is relatively as frequent in Persia as in France, complications are less common. As a rule, the disease is mild, and the relative immunity he ascribes to the very general abstinence from alcohol among the natives of this region.

Parasyphilitic Affections.—A. Post⁵ (Boston), following Fournier, includes under the name parasyphilitic affections the pigmentary syphilid; acute hysteroneurasthenia of the secondary period; divers neurast-

¹ Jour. Am. Med. Assoc., Jan. 2, 1904. ² Ann. de Derm. et de Syph., May, 1904.

³ Chicago Med. Recorder, Apr. 15, 1904. ⁴ Rec. d'Ophtal., Oct., 1903.

⁵ Boston M. and S. Jour., vol. cxlix, No. 16.

thenic manifestations of a more advanced stage; hysteroepilepsy; tabes; general paralysis; a special form of epilepsy; a special form of muscular atrophy; and the following forms of hereditary syphilis; numerous general or partial atrophies; organic malformations, notably dental malformations; arrest or retardation of development, physical or mental; infantilism, perhaps dwarfism; congenital inaptitude for life; rickets; hydrocephalus; certain cases of meningitis; perhaps certain cases of true epilepsy; certainly juvenile tabes. These manifestations are not cured either by mercury or the iodids. He states that there is a syphilitic lesion of the skin, the pigmentary syphilid, or the syphilitic vitiligo or leukoderma, particularly adapted to illustrate the parasymphilitic affections. It is impossible to deny the syphilitic origin of this manifestation, and yet, except for its location, the same lesion may be produced by divers morbid or perhaps physiologic causes totally unrelated to syphilis. These abnormalities in pigmentation constitute lesions which, derived from syphilis, do not belong exclusively to syphilis, and which are refractory to antisymphilitic remedies. They serve as a type of the curious pathologic conditions which are grouped under the name of parasymphilitic affections. In the adult these phenomena, which it is proposed to call parasymphilitic by Fournier, are mostly concerned with the nervous system.

Pathology of Syphilitic Initial Sclerosis of the Penis.—Ehrman¹ examined histologically prepuces which were the seat of initial lesions of syphilis, and summarized his conclusions as follows: The first changes are noticeable beneath the epithelium at the site of inoculation, and these consist of a new formation of blood-capillaries with cellular infiltration around them. By the gradual spreading of the virus into the tissue-spaces in the neighborhood, the lymphatic vessels next become involved, and infarctions of leukocytes occur in them. The cellular infiltration, by making its way into the surrounding lymph-spaces, gives to the lesion its clinical character of induration. Retrogressive changes next supervene, which end in the disappearance of the nodules of infiltration in the tissue-spaces and the infarcts in the lymphatic vessels. The softening, which occurs in these foci of infiltration, is not a necrobiosis, a granular destruction, or a caseation, but an infiltration through a fatty change, as shown by staining with osmic acid. He regards the lymphatic infarcts as barriers to prevent the spread of the syphilitic virus or toxin.

Latent Syphilis.—Jonathan Hutchinson² (London) dwells with considerable insistence on the teaching that the 2 earlier stages of syphilis may pursue a practically latent course. He emphasizes the fact that the primary sore of syphilis is not necessarily indurated in all cases, and that those who judge it entirely by this characteristic may be deceived. As a matter of fact, the primary syphilitic lesion may be so small, so little complicated by inflammatory reaction in the surrounding tissues, so painless and indolent in its course, as not to attract any unusual atten-

¹ Abstr. Brit. Jour. of Dermat., May, 1904, p. 189.

² The Clinical Journal, Aug. 5, 1903; editorial Jour. Am. Med. Assoc., Dec. 5, 1903.

tion, especially if it should occur in the neighborhood of the nails, where slight sores that run a slow course are not unusual. Hutchinson even claims that the infection of syphilis may enter in certain cases without any breach of cutaneous surface, and certainly without any obvious chancrous induration, and illustrates this point by reference to cases of surgeons who have acquired the disease in the practice of their profession without the occurrence of any local sore sufficient to arouse suspicion of its nature. As a chancre will disappear spontaneously, as a rule, in a little over 4 weeks, it is perfectly possible that this stage of the disease should be entirely missed. Nevertheless, the possibility of latent syphilis will, in many instances, have to be accepted.

Delayed Secondary Manifestations of Syphilis.—E. Emery and M. Druelle¹ report 2 cases in which mucous patches appeared—one, 10 years after infection, and the other, 20. The first patient had a typical chancre in 1893, which was followed by a roseola and mucous patches, all of which disappeared later. Ten years afterward tertiary manifestations accompanied by typical mucous patches in the mouth appeared. In the second case the disease was contracted in 1883 and typical manifestations appeared at that time. He developed a gumma on the leg and mucous patches on the tongue and buccal mucous membrane 20 years later.

Justus' Hemoglobin Test for Syphilis.—L. Feuerstein² considers the so-called Justus test of doubtful value. He tested carefully the blood of 45 syphilitic patients under mercurial treatment, and found that only in 5 was there a distinct diminution of hemoglobin; in 3 there was a decided increase, while in the others there was no definite change. In 1 of the 5 cases in which the reaction was positive it was shown that the patient was not syphilitic. He concludes that this test cannot be regarded as a definite indication of this disease.

Syphilis Insontium.—M. Melot³ reports the case of a man, while walking along the street, being struck on the tip of the nose by the whirling whip of a passing cabman. A scratch was produced which one month later developed into a chancre. Investigation showed that the cabman had mucous patches in the mouth and that he was in the habit of sucking the lash of the whip.

Syphilis and Divorce.—P. A. Morrow⁴ (New York city), in a discourse on the medicolegal aspect of syphilis, states that in regard to the physician's line of conduct in the matter of syphilis and divorce it is rarely advisable that he should appear in the interests of his patient. The proof of the communication of the disease can be furnished by a medical expert appointed by the court for the purpose of making an investigation. If the physician has treated the wife, his prescriptions are always available in furnishing presumptive proof, at least, of the nature of the disease for which he has treated her. He cautions against the attending physician giving a letter or certificate that she has syphilis

¹ Arch. gén. de Méd., Sept. 29, 1903, tome 2, p. 2440.

² Arch. f. Dermat. u. Syph., Dec., 1903.

³ Jour. de Méd. de Brux., Sept. 24, 1903.

⁴ Med. News, Dec. 12, 1903.

and that he is treating her for it. In the first place, he may be the physician of both husband and wife, and should he give a certificate, it would betray the secret the husband confided in him. In the second place, certificates of this character are looked upon with suspicion and have even been rejected by the courts.

Syphilis in its Ethical Relations.—S. S. Jones¹ reviews the system in force on the European continent of licensing houses of prostitution and of placing them under police and medical supervision, and shows that, on the whole, these methods of checking venereal disease had been failures. In support of this argument he produces numerous statistics. For instance, in 1843, there were 235 licensed houses in Paris; in 1888, only 67; in 1887, 927 licensed prostitutes and 3755 unlicensed. In St. Petersburg, in 1872, there were 220 licensed houses. In 1890, only 67. In 1891 there were in St. Petersburg 608 licensed prostitutes, and 2319 others. The percentage of prostitutes suffering from venereal disease was, in Paris, from 1878 to 1887, in licensed houses, 25 %, 12 % of whom were suffering from syphilis. In other houses, 15 % and 7 %. In Brussels, 1887 to 1889, 50 % were suffering from venereal disease; 25 % from syphilis, against 33 % and 9 %. In St. Petersburg, 56 % suffering from venereal disease; 33 % from syphilis as against 19 % and 12 %. Lyons, 85 % suffering from venereal disease, 4 % in ordinary houses. Rotterdam, 25 % against 10 %. In houses under observation the percentage of syphilis under regulation was larger than in other houses. He further states: It has been found from statistics that those living in controlled houses are oftener in the hospitals; 90 % of them have entered the hospitals as against 22.4 % of outside prostitutes. In his opinion the solution of the problem lies in education of the public as to the nature of the disease, the method of its communication, and the symptoms which indicate its existence and its onset.

Copper in Syphilis.—A. F. Price,² U. S. N., notes an intolerance of the copper salt as characteristic of old syphilis. For convenience, a tablet of copper arsenite of $\frac{1}{3200}$ grain, issued by the medical department of the navy, is used at the beginning of the treatment of cases of old syphilis; and frequently it cannot be borne. One-half of one or one-quarter, or even less, once a day, will sometimes cause feelings of prostration and almost collapse. As far as his observation goes there exists no other disease in which there is this sensitiveness to copper. He therefore considers it a valuable diagnostic aid. Price further states that copper seems to be an antisypilitic of unusual potency, and appears at its best when aided by mercury. Treatment of acute syphilis by this method is very satisfactory in all stages. In the stage of the secondary eruption $\frac{1}{30}$ grain of cupric sulfate is given with 1 grain of blue-mass, 3 times daily, gradually increasing the mercury. In old syphilis in any form the copper salt must be given in minute doses, and gradually increased as tolerance is established until the usual dose of $\frac{1}{30}$ grain is given, when the mercurial should be added in a rather small dose. Tonics, he believes, while useful,

¹ Am. Med. Review of Reviews, Sept. 25, 1903.

² Med. Rec., Nov. 10, 1903.

occupy a subordinate place in the treatment. Alcohol and tobacco should be denied syphilitics.

Hereditary Syphilis.—Filatov¹ advises, in children with hereditary syphilis, primarily, treatment of the parents, but if too late, baths with sublimate should be given the child, or the following:

- R. Calomel.....gr. j
 Saccharated iron carbonate.....gr. viij
 Sugar..... $\overline{5}$ j

M. Divide in 12 powders; one powder twice daily.

In cases of relapse in older children:

- R. Mercuric perchlorid.....gr. j
 Distilled water..... $\overline{5}$ ij
 Syrup..... $\overline{5}$ iiss

M. Sig.—Teaspoonful once daily, after a meal.

While friction is not well borne in infants, in older children mercurial ointment (5 grains) may be rubbed in energetically when urgent symptoms present themselves. In cases of syphilitic snuffles or affections of the throat or mouth the mucous membrane should be penciled once or twice daily with:

- R. Mercuric perchlorid.....gr. j
 Distilled water..... $\overline{5}$ ij

M. Sig.—Local application.

Hypodermatic Medication in Syphilis.—A. M. Forbes² states that the most prompt action and surest dosage is obtained by the hypodermatic method. He has prepared powders of corrosive sublimate, each 1 grain, which he dissolves in 30 minims of boiling water at the time of infection. He begins with 5 minims twice a week injected deeply into the gluteus maximus, and increases the dose until the full 30 minims are given.

Lemoine³ recommends the following formulas for hypodermatic injection:

- R. Hydrarg. benzoatis.....gr. ivss (0.30 gm.)
 Sodii chloridi.....
 Cocainæ hydrochlor.....aa gr. iij (0.20 gm.)
 Aquæ destil..... $\overline{3}$ j (30.00 gm.)
- M. Sig.—Thirty to 60 drops, injected hypodermatically. Or:
- R. Hydrarg. bichloridi.....gr. ivss (0.30 gm.)
 Cocainæ hydrochlor.....
 Sodii chloridi.....gr. iss (0.09 gm.)
 Aquæ destil..... $\overline{3}$ j (30.00 gm.)
- M. Sig.—Seven to 15 minims daily. Or:
- R. Hydrarg. biniodidi.....gr. $\frac{1}{4}$ (0.050 gm.)
 Atropinæ sulph.....gr. $\frac{1}{4}$ (0.005 gm.)
 Aquæ destil..... $\overline{3}$ v (20.000 gm.)
- M. Sig.—Four to 7 minims daily. Or:
- R. Hydrarg. peptonatis.....gr. iss (0.15 gm.)
 Aquæ destil..... $\overline{3}$ j (30.00 gm.)
- M. Sig.—Seven to 15 drops daily.

Lafay⁴ suggests the following, which he calls his isotonic solution:

- R. Mercury biniodid.....
 Dry sodium iodid.....aa 75 grains (5 gm.)
 Normal salt solution.....3 $\frac{1}{4}$ ounces (100 gm.)

Six drops of this mixture are to be injected into the muscles daily.

¹ N. Y. Med. Jour., Dec. 26, 1903.

² Montreal Med. Jour., Aug., 1903.

³ Abstr. Jour. Am. Med. Assoc., Aug. 15, 1903.

⁴ Abstr. N. Y. Med. Jour., Dec. 19, 1903.

Brousse's formula is:

R. Hydrarg. biniodid. gr. iss (0.1 gm.)
 Potass. iodid. gr. iij (0.2 gm.)
 Sodii cacodylat. gr. viiss (0.5 gm.)
 Aq. destil. q.s. ad ʒiiss (10.0 gm.)

M. Sig.—Inject 15 to 30 minims every 2 days for 10 days; suspend for 5 days; 10 monthly injections for 3 months.

Gaillon¹ speaks highly of the following mixture, suggested by Gaucher:

R. Hydrarg. benzoat. gr. xv (1.00 gm.)
 Sodii chlorid. gr. xi¼ (0.75 gm.)
 Aquæ destil. (sterile) ʒiii¼ (100.00 gm.)

M. Sig.—Inject from 30 to 75 minims.

Gangrene from Mercurial Injections.—Pflüger² has rejected the employment of intramuscular injections of mercury in syphilis on account of the frequency with which this procedure is followed by gangrene. The method of subcutaneous injection he still retains, since the possible gangrene from this method would be less serious.

THERAPEUTICS.

Treatment of Leprosy by Hypodermatic Injection of Mercuric Bichlorid.—Neish and Tonkin³ advocate the intramuscular injection of mercuric bichlorid and common salt, of each ¼ grain dissolved in 20 minims of distilled water, twice weekly, as an adjunct to the general treatment of leprosy. In 100 cases in Jamaica so treated the results were encouraging.

Sea-bathing in some Forms of Skin Diseases.—R. Abrahams⁴ (New York city) contributes the results of his experience with this method of treatment, extending over 2 summers, applied to pityriasis versicolor (6 cases), herpes tonsurans maculosus et squamosus (3 cases), chronic eczema (5 cases), and pruritus senilis (2 cases). In all these cases the observer claims most marvelous beneficial results.

Clay Pastes.—J. F. Wallis (Philadelphia) advises the use of clay pastes⁵ in the treatment of eczema because of the properties wet clay possesses of holding water and assisting osmosis, in addition to the therapeutic virtues in the mineral salts contained therein. The following is recommended by him: Kaolin, 50 parts; water, 25 parts; petrolatum, 25 parts; ichthyol, 4 parts.

Empyroform.—B. Sklarek⁶ (Breslau) considers that the color and weak odor of empyroform give it great advantages over tar, to which it is similar in therapeutic properties. He employed it in powder form, pure and also mixed with zinc and starch, in moist eczemas in conjunction with a salve-muslin, but found a mixture of the empyroform in a salve or a zinc paste more convenient and efficacious. In consequence of its desiccating properties it is very useful in suspension, but should not be

¹ Lyon Méd., Nov. 8, 1903.

³ Bristol Med.-Chir. Jour., Mar., 1904.

⁵ Therap. Gaz., Sept. 15, 1903.

² Arch. f. Dermat. u. Syph., lx, 3.

⁴ N. Y. State Jour. of Med., Jan., 1904

⁶ Therap. d. Gegenwart, July, 1903.

prescribed in too large amounts at one time. This drug has the great advantage that it can be used on individuals who cannot tolerate tar. He recommends the following formulas: (1) Empyroform, 15.0 ($\frac{1}{2}$ ounce); talc. venet., glycerin., āā 10.0 ($2\frac{1}{2}$ drams); aq. dest., 20.0 (5 drams); or spts. vini and aq. dest., āā 10.0 ($2\frac{1}{2}$ drams). M. S.—Paint. Shake well before applying. (2) Empyroform, 5.0–10.0 ($1\frac{1}{2}$ drams to $2\frac{1}{2}$ drams); chloroform., tinct. benz., āā ad 50.0 ($1\frac{1}{2}$ ounces). M. Sig.—Paint.

Cadmium Iodid in Acne Rosacea.—H. S. Purdon¹ (Belfast) advises, in the erythematous stage of acne rosacea, the use of an ointment containing 10 grains of cadmium iodid to 1 ounce of vaselin, rubbed well into the cheeks and nose at night, and washed off next morning with hot water and an overfatted soap, accompanied by massage of all the affected skin. The cadmium iodid is an excellent local stimulant and does not stain the skin.

Silver Fluorid in Erysipelas and Smallpox.—The use of silver fluorid as a local antiseptic, exerting more or less internal antiseptic properties by its absorption, has recently been recommended by a number of Italian physicians in diseases such as smallpox, anthrax, erysipelas, and even in puerperal sepsis; it is comparatively harmless. F. Jaja and F. Dee Narchis² report a case of variola of the confluent form, in which the use of a 1 : 10,000 solution by means of a pressure spray, 4 times daily, lessened the course of the case, the disease terminating favorably at the end of 22 days. The spray served to abort the vesicles and to prevent pustule-formation. In erysipelas this silver salt was of value in lessening the local manifestations and in relieving the constitutional symptoms. It should be remembered, however, that this preparation stains linens and other fabrics.

Formol in Hyperidrosis Plantaris.—Vaillard³ recommends formol in this affection, owing to its power of forming insoluble compounds with albuminoids. It diminishes the excretion of sweat by acting on the epithelium of the sweat-glands, but its effects are only temporary and its application must be repeated.

Hydrochloric Acid in the Treatment of Lupus.—Dreuw⁴ describes a new method of treatment, consisting in first freezing the diseased area with ethyl chlorid, after which crude hydrochloric acid is rubbed in freely by means of a stick wrapped with cotton. A dusting-powder is then applied. After a period of a week or two the crusts fall off and a portion of the lupus tissue comes away with them. The application can be repeated if necessary.

Sodium Salicylate in Lupus.—A. Plique,⁵ in 2 obstinate cases of facial lupus, applied sodium salicylate 1 part, distilled water 8 parts, to the diseased area night and morning, with marked improvement in the condition. The only untoward effect produced was a slightly dis-

¹ Dublin Med. Jour., Sept. 1, 1903. ² Riforma Medica, Palmers No. 7, 1904.

³ Abstr. in Brit. Med. Jour., Dec. 12, 1903.

⁴ Monatsh. f. prakt. Dermat., xxxvii, No. 5.

⁵ Jour. de méd. et Chir. pratique, 1903, No. 24, p. 269.

figuring white pellicle, which was overcome to a great extent by the addition of a very small quantity of fuchsin to the solution.

Treatment of Frambesia.—Diesing,¹ from an extensive experience with this disease, recommends injecting a 30 % emulsion of iodoform and olive oil into the subcutaneous tissue of the affected part and painting the affected area and surrounding skin with tincture of iodine. The injections should be occasionally repeated, and the application of iodine should be made once or twice daily for at least one month. Two permanent cures by this treatment are reported by this observer.

Anthrasol.—Sack² again brings forward this coal-tar derivative previously introduced by him as an infallible remedy in the relief of pruriginous cutaneous conditions. In general pruritus it should be employed in moderately weak solutions, preferably 10 % in alcohol or acetone. In circumscribed itching from any cause it may be used in a strength of 20 %, 30 %, or even pure. Undiluted anthrasol or anthrasol and glycerin are of great benefit in pruritus ani. In psoriasis it should be used in salve form, and is rendered more effective by the addition of sulfur, resorcin, salicylic acid, etc. Sack prefers the following ointment formula: Anthrasol, 3 gm.; lanolin, 3 gm.; ung. glycerin., q. s. ad 30 gm.

Sublamin in Parasitic Diseases of the Scalp.—W. S. Gottheil³ found this drug valuable in an epidemic of tinea tonsurans in New York, where, out of 900 children in an orphan asylum, 450 were affected. A solution of 1 : 1000 proved less irritating than corrosive sublimate, and was found to cause less inflammatory reaction, and cures were more rapid with the new remedy than with the old. Gottheil states that a fungus not to be distinguished from the trichophyton could be cultivated from the scalps of persons who seemed to have no disease.

Mercurials.—Arvid Blomquist⁴ has prepared a new mercurial oil containing 90 % of mercury, which is termed *mercuriol*. The mercury preparation is an amalgam of aluminum and magnesium, and the oil is made by combining the mercuriol with dry almond oil. It is used by injection for the treatment of syphilis by Moller.

Hermophenyl is recommended by Nicolle⁵ for intramuscular injections in syphilis. It is an organic compound containing 40 % of mercury, and is soluble in water. The dose usually employed is 1 cc. of a 1 % solution.

Leegal⁶ uses a somewhat similar preparation, which is called *hydrarg. hermophenylicum*. Its chemie formula is $C_6H_5O(S_2ONa)_2Hg$. It is an amorphous white powder and contains but 20 % of mercury. The dose is larger than that of the preceding preparation, being usually 4 cc. of a 0.5 % solution in water. It is also employed hypodermatically, and has the great advantage that there is no induration or irritation at the point of injection after the use.

Mercurio-Crème is one of the recent preparations brought forward by

¹ Arch. f. Schiffs- u. Tropen-Hygiene, Bd. vii, Heft 4.

² Monatsh. f. prakt. Dermat., Bd. xxxvii, No. 11.

³ Med. News, Oct. 17, 1903.

⁴ Arch. f. Dermat. u. Syph., 1903, lxvi, p. 98.

⁵ Bull. gén. de Therap., 1903, vol. cxlv, No. 3, p. 108.

⁶ Berl. klin. Woch., Oct. 19, 1903, No. 42, p. 962.

D. J. Seliei.¹ It is a solution of potassium stearate in glycerin with 33½ % of mercury. It is intended to replace mercurial ointment, being neither dirty nor bad-smelling, and having the additional advantage of drying very rapidly.

L. Jullien and F. Berlioz² have combined a cacodylate of ammonium with an oxid of mercury, forming a mercurial cacodylate, a gray powder, very soluble in water, containing at least 56 parts of mercury in 100. In tests on at least 50 patients, a dose of ¼ to ½ of a grain was very well borne. They have also obtained another salt, the ammonium-chloro-mercurate, which is made by dissolving the yellow oxid in the solution of ammonium chlorid. The dose is the same as that of corrosive sublimate, than which this new drug is less irritating.

Treatment of Acne, Furunculosis, and Sycosis by Inoculations of Staphylococcus Vaccine.—A. E. Wright³ concludes, from the results of his experiments with staphylococcus vaccine in the treatment of furunculosis, sycosis, and acne, that it is satisfactorily established that chronic staphylococcus invasions can be effectively treated by inoculations of a staphylococcus vaccine. He states that these inoculations induce the chemic machinery of the patient to elaborate the protective secretion which is required for the destruction of invading bacteria. Clinical improvement followed improvement in the phagocytic power, and the negative phase which supervened upon inoculation revealed itself in diminution in phagocytic power and sometimes in the appearance of fresh lesions.

RADIOTHERAPY.

D. C. Dennett⁴ (Winchester, Mass.), in reviewing the subject of röntgen-ray treatment, states that in his practice it has proved to be the most powerful and useful therapeutic measure in eczema, psoriasis, superficial malignant diseases, the pain of deep cancer, neuralgia, cough of phthisis, muscle-pains, and ulcers, and gives the histories of 12 cases to support this statement. He finds that eczema melts away very rapidly in exposure to the röntgen ray. The analgesic effects are, in his opinion, brought about by direct action on the nerve-terminals and possibly the deeper nervous centers. The caution is given that no exposure sufficient to produce more than a slight dermatitis should ever be made, and rarely should a dermatitis be produced at all. It is also remarked that the proper dose of the röntgen ray varies, like the dose of any remedy, within pretty wide limits. Some patients are more susceptible than others. Fair, delicate, thin-skinned types require a smaller dose, as a rule, than stronger patients of the brunet type. He believes that after a certain number of daily treatments have been given it is well to discontinue them for a week or 10 days, and note if progressive improvement does or does not take place, as too long-continued treatment may result in permanent impairment of the vitality of the tissues.

¹ Monatsh. f. prakt. Dermat., 1903, xxxvi, p. 503.

² Les Nouveaux Remèdes, 1903, vol. x, No. 10, p. 223.

³ Brit. Med. Jour., May 7, 1904.

⁴ Med. Rec., Feb. 13, 1904.

A. J. Harrison and W. K. Wills¹ (Bristol, Eng.), in a review of their results in the treatment of skin diseases, give some very interesting information regarding this form of therapy. Three cases of acne vulgaris, 1 of sycosis, 2 of otherwise intractable eczema resembling Paget's disease, 1 of Paget's disease, and 1 of eczema barbae were successfully treated. Fifty cases of lupus received treatment with benefit, but in a few cases very little diminution in the affected area took place. Even in these cases improvement had taken place in that further extension was retarded. It is the practice of these observers to continue the "light treatment" as long as there is disease (lupus) in the skin, and to treat the mucous membranes with the röntgen rays; but where the skin is ulcerated or extremely infiltrated, or where reactions are hard to obtain, periodic exposures are given with the röntgen-ray tube in addition. Six cases of lupus erythematosum were treated. One incipient case was cured, 1 discontinued treatment, and 4 were slightly improved. Eighteen cases of rodent ulcer received treatment. One was relieved entirely, 7 improved under treatment, 2 were unsatisfactory through nonattendance or bad attendance, and 1 was made worse.

W. A. Jamieson,² in a recent paper, reported 133 cases of lupus vulgaris treated by the röntgen ray and by the Finsen light with marked success. In addition he records 30 cases of favus, 21 of rodent ulcer, 12 of sycosis, and 2 of mycosis fungoides treated by exposure to the röntgen ray, in all of which perseverance in the treatment produced marked benefit, if not a complete cure. In using the Finsen method he obtained best results from the London Hospital modification of the Lortet-Genoud lamp.

H. K. Pancoast³ employed the röntgen ray in keloid in several negros, over an extended period, with disappearance of the growth and complete removal of the pigment in the diseased areas. This was more marked by reason of the color of the patient, but it is reasonable to suppose that in light-skinned individuals this would not have attracted attention.

Schamberg⁴ treated acne, eczema, psoriasis, acne rosacea, sycosis, tinea sycosis, ichthyosis, vitiligo, folliculitis, leukokeratosis lingualis, verruca, mycosis fungoides, and dermatitis herpetiformis with the röntgen ray with encouraging results. As regards eczema, this observer speaks of 16 cases in which radiotherapy was of undoubted value, and in 14 cases he observed prompt and certain improvement, even in otherwise most rebellious and long-standing cases.

Stelwagon⁵ has likewise treated acne vulgaris and other skin diseases with this method of treatment. In acne he has found it to be beneficial in a number of instances, but not to the universal extent claimed by Zeisler, Campbell, and others. In acne rosacea he observed that the patulous gland-ducts and hypertrophy were affected, and that while some cases were quickly and decidedly benefited, others were practically

¹ Brit. Med.-Chir. Jour., Dec., 1903. ² Scottish M. and S. Jour., Feb., 1904, p. 97.

³ Proc. Phila. County Med. Soc., Nov. 30, 1903, p. 238.

⁴ Proc. Phila. County Med. Soc., Nov. 30, 1903, p. 240.

⁵ Jour. of Cutan. Dis., Aug., 1903, p. 353.

uninfluenced. In psoriasis this observer used it with success in cases of a most rebellious type, carrying the treatment to the extent of a slight flush or erythema. In keratosis of the palms and soles, and in hyperidrosis, he obtained most gratifying results from the röntgen ray. Various observers have, from time to time, employed radiotherapy in affections such as hypertrichosis, sycosis, favus, and ringworm with more or less success. In comparatively trivial and inoffensive affections its use is dangerous, and it should, preferably, be restricted to stubborn types of these diseases.

Radiotherapy in Mycosis Fungoides.—O. S. Ormsby¹ (Chicago), in a case of mycosis fungoides in the prefungoid stage, exposed the diseased areas to the röntgen ray, with marked improvement. The distance of the antikathode or "target" from the lesion averaged 8 inches, and the duration of the individual treatments averaged 5 minutes. The method of treatment pursued was to select 10 or 12 areas and treat half of them on each alternate day until a given area had received about 12 treatments. Every lesion treated disappeared, and no recurrence took place in these areas. Some lesions that were not treated also disappeared. Many new lesions, however, developed during the treatment. J. P. Marsh² (Troy, N. Y.) also reports a case of mycosis fungoides which was symptomatically cured. The disease was limited to 3 lesions: An ulcerating lesion on the upper lip, which received 8 treatments; a hard nodular and ulcerating tumor on the side of the nose, which received 29 treatments; and a lesion on the back of the neck, 2 inches in diameter, having an elevated border, a scaly center, and at top an ulcerating margin. These all disappeared under treatment, and there were no new lesions during the treatment. W. A. Jamieson,³ in a clinical lecture on phototherapy, stated that in mycosis fungoides the röntgen ray offered the sole means of cure, and related 2 cases of the disease in which this had been effected. He also referred to 30 cases of favus and 12 of sycosis in which great benefit was produced. He believed the röntgen ray exerted no lethal action on microbes.

Radiotherapy in Acne Vulgaris.—M. F. Engmann⁴ (St. Louis) states that in his experience the röntgen rays are particularly beneficial in 2 forms of acne: (1) Acne indurata, so called, when the lesions are flatly convex, presenting no summit or peak, whether superficial or deeply situated, and when of a markedly inflammatory nature; (2) acne rosacea, accompanied more or less by active inflammatory symptoms. In order to prevent undue reaction he regulates the exposure according to the patient's susceptibility to the sun's rays. In the usual run of cases the first exposure is 5 minutes, with a soft tube, emitting enough light to show the outlines of the hand upon the fluoroscope. The hair, eyes, and eyebrows are protected by lead-foil. The tube is placed at a distance of 9 inches from the skin. Four days later a similar exposure is made, then 3 days later, and afterward 2 days. After the initial exposures the rays are used 3 times a week, the length of time varying from 5 to 10

¹ Medicine, Dec., 1903.

² Am. Jour. Med. Sci., Aug., 1903.

³ Brit. Med. Jour., Jan. 16, 1904.

⁴ Interstate Med. Jour., Apr., 1904.

minutes, according to the state of the case, with the tube never nearer the skin than 6 inches—usually 8 inches. The light is always at the initial degree, and in no case does the current exceed 2 ampères. By this mild treatment the lesions disappear without producing erythema or bronzing. Proceeding in this cautious manner, an eruption is removed in from 4 to 16 weeks. Relapse is prevented by weekly exposures over an extended period.

Röntgen Rays in the Treatment of Cancerous and Cutaneous Affections.—J. H. Brandt¹ (New York) states that in cancer the results with this remedy are variable. The deeper the cancer, the greater the difficulty to conquer the disease; yet it has been his observation that in nearly all deep-seated cancers, especially of the breast, the disease comes to a period of rest, further development being stopped for a time, but a hard, more or less doughy deposit remains as a dormant focus. To displace the knife indiscriminately by röntgen-ray applications is, in his opinion, wrong. He is favorably inclined toward postoperative röntgen-ray treatment. In epithelioma, rodent ulcer, lupus, and some other skin affections he considers the röntgen ray an almost certain remedy.

Cutaneous Blastomycosis Treated by the Röntgen Ray.—E. A. Fischkin² (Chicago) records a case of cutaneous blastomycosis involving an area about three-fourths of an inch in width and one inch in length, extending from the lower eyelid, encircling the external canthus, and reach to the upper eyelid on the left side of the face. The lesion was elevated and covered with a thick, dark, adherent crust, on removal of which a papillary growth was exposed. Another lesion was also present on the back of the neck. Microscopic examination confirmed the diagnosis of blastomycosis. Potassium iodid was administered internally, and the growth was exposed daily to the röntgen ray. At the end of 3 weeks reaction occurred and the röntgen ray was discontinued for a while. With the subsidence of the reaction there suddenly appeared miliary abscesses at the proximal borders of the lesion and a new growth at the margin of the previous lesion. The intensity of the radiation and the dose of the potassium iodid were increased and this lesion disappeared. The reappearance of the growth was repeated several times and its absorption was effected as before. The patient had, in all, 60 radiations, and the maximum dose of potassium iodid was one-half ounce a day. It was apparently cured at the time of writing. The growth on the neck flattened down quickly and showed no tendency to relapse.

Röntgen-ray Dermatitis as Influenced by Idiosyncrasy.—A. D. Rockwell³ (New York city) believes that idiosyncrasy is a quantity in the use of the röntgen ray in diagnosis and therapeutics. He cautions against failing to interrogate each patient as to any special susceptibility as to sunburn, ivy-poison, or any external application, and gives the history of a case in which an intensely active dermatitis followed short exposures. He considers this case not only as indicating marked susceptibility to the effects of the röntgen ray, but also as a strong argument in favor

¹ N. Y. Med. Jour., June 11, 1904.

² Chicago Medical Recorder, Dec., 1903.

³ Med. Rec., Jan. 16, 1904.

of the cumulative theory of röntgen-ray action. As a preventive of burns, he advises an interval of rest between the sittings.

Action of the X-ray.—Taking into consideration 3 various effects of the röntgen ray, W. A. Pusey¹ believes that the actions which will be of value, from a therapeutic standpoint, are: the action of causing atrophy of the appendages of the skin; the destructive action upon organisms in living tissues; the power of destroying certain pathologic tissues, and the anodyne action, to which attention has been called in malignant growths, in neuralgias, and in diseases of the skin accompanied by itching. In the matter of application of these actions Pusey has further shown that the röntgen ray may be employed to meet the following conditions: To remove hair; to cause exfoliation of the nails; to cause atrophy or decrease in the functional activity of the sebaceous glands; to destroy bacteria; to influence the nutrition of the skin; to destroy tissues of low resistance; and to relieve pain or itching.

Histologic Appearances of a Röntgen-ray Ulcer in a Rabbit.—A. Gassmann² produced a röntgen-ray ulcer in a rabbit and noted the histologic changes of the same. The muscular layer of the bloodvessels had assumed a sieve-like appearance from spaces forming between the cells, and the intima had become thickened. A cellular infiltration was present around the perineurium of the nerves. The fibrous bundles were broken up and surrounded by a cellular infiltrate made up of plasma-cells, leukocytes, and Unna's plate-cells.

Röntgen-ray Technic.—F. S. Burns³ (Boston) believes that tubes of low vacuum are best adapted to therapeutic work. The quality of rays that has seemed to be best for cutaneous use are those showing black bones of the hand with the fluoroscope at a distance of one foot from the tube; this degree being generated by 1.5 to 3 ampères of primary current and induced by a coil with a maximum spark distance of 12 inches, the frequency of interruptions varying between 20,000 and 30,000 a minute. This observer has also adopted the penetrability of aluminum as a standard of measurement, as suggested by Dodd. In a block of aluminum 1 inch thick and 4 inches long a series of 8 holes were bored, the first hole leaving a remaining thickness of $\frac{1}{8}$ of an inch, the second $\frac{2}{8}$ of an inch, and each succeeding $\frac{1}{8}$ inch thicker, until the eighth, which had a thickness of 1 inch. The block, fastened to a fluoroscope and adjusted before a radiating tube, shows a certain degree of potentiality according to the thickness of the aluminum penetrated. The degree of radiations most suitable for epithelioma, tuberculosis, etc., is that penetrating a $\frac{2}{8}$ inch thickness of aluminum, while the succeeding degree of $\frac{3}{8}$ remains quite opaque. In nonulcerative epitheliomas he believes that a preliminary curetage or cauterization is a useful adjunct to the röntgen-ray treatment. In deep-seated malignant growths he found the röntgen ray to be of benefit only in relieving pain. His results with it in psoriasis and eczema were extremely gratifying.

¹ Jour. of Cutan. Dis., Aug., 1903, p. 335.

² Arch. f. Dermat. u. Syph., May, 1904, p. 97.

³ Boston M. and S. Jour., Oct. 20, 1903.

A. W. Wigmore¹ (London), in employing the röntgen rays for therapeutic purposes, uses a Mackenzie-Davidson break with a coil of 12-inch spark and a medium hard tube. He uses 24 volts for the break and coil and generally gives 3 ampères with the surface of the tube 4 inches from affected part. He generally protects the surrounding parts by thick lead-foil covered on both sides with silk, as the emanations from the tube consist of a large amount of static electricity from the surface of the glass, combined with the röntgen rays from the interior, the lead-foil thus cutting off the rays, and the silk, the electricity. His experience has led him to trust in short applications, 5 to 10 minutes, ceasing treatment when marked dermal irritation occurs, but keeping the patient under observation. He reports 9 cases of cutaneous disease (lupus, eczema, rodent ulcer, and psoriasis), in which his method was followed by gratifying results.

Focusing Adjustment for Röntgen-ray Tubes.—R. V. Wagner² (Chicago) describes a röntgen-ray tube with adjustable focus. The anode is mounted on a threaded stem which can be magnetically operated through the glass so as to move the anode up or down, in this way adjusting the focus. The little armature on which the magnet acts cannot possibly get out of adjustment, and will hold the anode in any required position, either in focus or out of focus, as the operator may desire for therapeutic purposes. Heretofore there has been great difficulty in obtaining a tube which was properly focused, as the adjustment has been made empirically before the tube is exhausted, so that the obtaining of a well-focused tube is a matter of chance.

Protecting Screen for Röntgen-ray Treatment.—Wm. S. Newcomet³ (Philadelphia) employs a protecting screen consisting of a frame made of wooden strips about 2 inches wide and 5 feet 5 inches high; the distance from the two sides is 20 inches; this makes a center of 10 inches; the front will give two more sides of 12 inches in width, 10 inches from a common center; the back is left open for the operator to work the apparatus, and at the same time he can see the proper exposure of the area to be treated, which cannot be done so readily by the other methods. If this frame were complete in the back, it would be a regular 6-sided prism. The whole frame, or at least the active part, is covered with lead, and in this lead windows of various sizes are cut; these windows have smaller sheets, which reduce the size to the desired opening for the individual case. The tube-holder is fastened to the side of the frame, and should have several universal joints which will allow the tube to be set at different positions, besides varying the distance from the different sides, should this be desired. For the sake of privacy, movable frames are made to fit at the 3 corners. These can be covered with some material that will give all the privacy of separate rooms, the frames being fastened with a detachable hinge.

The Finsen Light and Röntgen Rays in Treatment of Skin Diseases.—J. F. Schamberg⁴ (Philadelphia), in a detailed report of his

¹ Brit. Med. Jour., Apr. 23, 1904.

² Jour. Am. Med. Assoc., Mar. 26, 1904.

³ Amer. Med., Mar. 5, 1904.

⁴ Amer. Med., Dec. 19, 1903.

own results with both modes of treatment, reaches the following conclusions: (1) The Finsen light is recognized as the best known treatment for lupus vulgaris, but in order to secure good results it is necessary to employ the large lamp used by Finsen. The smaller modified lamps may suffice for recent and superficial cases, but do not produce sufficient penetration of light to cure long-standing and deep-seated lesions. (2) In lupus erythematosus the Finsen light effected some improvement, but no cures. (3) In certain cases of lupus vulgaris, especially when the nodules are ulcerated, when the mucous membrane of the nose, lips, or mouth is affected, and probably also in hypertrophic and vegetative forms of the disease, the röntgen rays should be given preference over the Finsen light. (4) The röntgen rays have certain distinct limitations in the treatment of cancer of the skin. The rays will cure practically all patients having superficial cancer, and some with carcinoma of the integument. But the majority of deep-seated cutaneous and subcutaneous growths do not do well. (5) The röntgen rays are extremely valuable in acne, in which disease the most brilliant results are obtained, even in long-standing cases. (6) The röntgen rays are of value in many cases of eczema, both in relieving the itching and in effecting a disappearance of the eruption. (7) In psoriasis the effect of the röntgen rays is but temporary, and relapses are not less common than under other methods of treatment. (8) The röntgen rays have, in addition to the dermatoses mentioned, been found to be beneficial in sycosis, lichen planus, hypertrichosis, ringworm, and favus of hairy regions, tuberculosis of the skin, mycosis fungoides, blastomycetic dermatitis, localized pruritus, etc. (9) In the treatment of skin diseases the liability to the production of a burn, with ordinary precautionary measures, is extremely slight.

PHOTOTHERAPY.

Actinotherapy.—W. S. Gottheil,¹ in a review of the advances in this line of therapeutics, states that "actinotherapy" is the accepted designation for the method that employs the violet and ultraviolet spectral rays, that röntgen-ray treatment is known as "radiotherapy," and that the term "phototherapy" is applied to all kinds of light treatment collectively. He further says that the sun and the voltaic arc are the only efficient sources of actinotherapeutic energy we possess. In the present state of our knowledge on the subject he believes that it is quite useless to attempt actinotherapeutic work with anything less than 20 ampères and 55 volts, and double that force is desirable if the internal organs are to be treated. The spectral rays that we employ, he says, are certainly bactericidal. The light is in part directly bactericide and in part photochemic on the vasomotor nerves and the vascular structures. In addition to these there are more remote effects in the stimulation of the tissue oxidation processes and new connective-tissue formation. Considering its therapeutics, Gottheil remarks that in lupus vulgaris, tuberculosis verrucosa cutis, tubercular ulcer, postmortem tubercle, etc., it is firmly

¹ Jour. Am. Med. Assoc., Mar. 19, 1904.

established not only as the most eligible, effective, and innocuous treatment, but even as a test, since lesions that do not react and improve under it are not tubercular. He mentions lupus erythematosus as a new field for this treatment, and states that in 3 out of 4 cases under his observation cure was effected. He also treated several cases of alopecia areata with satisfactory results. In one case of sarcoma cutis the results were fairly good. He used this treatment in a number of cases of acne rosacea, but found it too slow to employ alone. He was unable to do anything with it in psoriasis.

F. H. Montgomery,¹ in referring to this subject, gives the following statistics: In *lupus erythematosus*, Finsen reported 31 cases with 11 recoveries and 10 still under treatment. Leredde and Pautrier record 23 cases with 11 recoveries, 6 cured in areas, 3 improved, and 3 failures. Gaston, Baudouin, and Chatun relate 10 cases with 3 recoveries and 7 improved. Norris and Dore report 11 cases, with great improvement in 7, in one of which the disease relapsed on cessation of treatment, 2 still under treatment, and 1 failure. Hyde, Ormsby, and Montgomery treated 19 cases; of these, 5 recovered, but in 1 case there was a return 4 months after the cessation of treatment; 9 showed great improvement, 1 discontinued treatment before it had been given a fair trial and was made decidedly worse. The best results in this group were obtained in those cases in which the vascular element prevailed, and in 2 cases of 8 and 12 months' duration respectively. Lesions with marked infiltration and glandular involvement were most resistant to treatment.

In *alopecia areata* Finsen and Forchhammer reported 49 cases, with 30 cured. Jersild gives an account of 6 cases, all of which were cured. Leredde and Pautrier record 3 recoveries and 5 cases in which the results were no better than by ordinary methods. Sabouraud, after an experience of 40 cases, concludes that this method is uncertain, but of value in obstinate cases. Hyde, Ormsby, and Montgomery record 8 cases, 5 of which gave encouraging results.

In *rosacea, telangiectasis, and vascular nevi* Finsen reported 25 cases of acne rosacea, with good results in 13, 10 cases of vascular nevi with 1 cured and 9 more or less improved. Leredde and Pautrier used the treatment in 6 cases of rosacea, with good results in all. Hyde, Ormsby, and Montgomery treated 2 cases of rosacea, one of telangiectasis, and 1 of vascular nevus, with excellent results in each.

In *carcinoma, epithelioma, and rodent ulcer* it has been successfully employed by Finsen, Bang, Bie, Leredde, Morris, Sequeira, and others, but is more expensive and tedious than röntgen-ray treatment.

Schamberg,² in considering the Finsen treatment by means of the London Hospital lamp, does not speak very favorably of that form of apparatus. Fifteen patients were treated in all, making a total of 897 exposures. None of these were cured by this treatment, although improvement occurred in some. Nearly all the cases were of long duration. In his experience the small lamp did not give sufficient penetration to

¹ Jour. of Cutan. Dis., Dec., 1903.

² Proceedings of Phila. County Medical Soc., 1903, No. 30.

destroy deep-seated lupus nodules, although the surface reaction was prompt.

Harrison and Wills,¹ in the report of their cases at the British General Hospital in 1901 and 1902, with the same kind of lamp, give more favorable results than those detailed by Schamberg: These observers employed 2 Lorbet-Genoud lamps made by Marshall and Woods of London at first, but later replaced these by 2 lamps made by Miller. Their report covered 42 cases of lupus vulgaris, 3 of lupus erythematosus, 12 of rodent ulcer, and miscellaneous cases. In nearly all these the results were satisfactory.

Physical Factors in Phototherapy.—J. E. Barnard and H. de R. Morgan,² in a report of a series of investigations undertaken to ascertain to what agencies the therapeutic effects of the light treatment may be attributed, bring forward some very interesting information. They refer to the work of previous observers to show that light, without heat, destroys microorganisms outside of the body. They state that destruction of bacteria lying inside of the body-tissues by the action of light is a matter of considerable doubt. Light is, in the first place, powerless to destroy bacteria in those cases where its rays are made to pass through any organic substance before impinging on the bacteria, even the thinnest film of agar, for instance, serving as a protection. This they proved experimentally, and from these experiments they concluded that the bactericidal rays, being nonpenetrative, the therapeutic effects of light may possibly be due to the reaction produced in the tissues by the light, rather than to the direct bactericidal action of the rays themselves. They also determined that the bactericidal effect of light was confined to the ultraviolet portion, about its middle third, and that the rays that excite tissue-reaction exist somewhere in the ultraviolet region. When glass was used in the experiment to filter out the ultraviolet rays, no reaction occurred. In these several kinds of experiments the bactericidal effect of different kinds of electrodes was also ascertained. It was found that the time required to destroy the bacilli using different electrodes in the arc lamp, with in each case a current of 11 ampères, at a distance of 10 cm. from the arc, varied as follows: Ordinary carbon, 30 minutes; carbons charged with silver, 30 minutes; carbons charged with iron, 15 minutes; carbons charged with cadmium, 15 minutes; carbons charged with aluminum, 25 minutes. The resistance of the bacteria to the rays was found to vary considerably according to the mediums in which they were placed.

A New Phototherapeutic Lamp.—H. G. Piffard³ (New York city) has devised a simple and convenient form of lamp for therapeutic purposes (Fig. 7). The terminals are of iron, and by giving free ventilation, he is enabled to dispense with water-tubes. One of the terminals is fixed, and to this he attaches the cord carrying the positive current. The other is movable, and by means of an adjusting spring is maintained at a proper arcing distance. The lamp may be attached with proper resistance in series to any outlet connected with a commercial 110 volt D.C. circuit.

¹ Jour. of Cutan. Dis., June, 1903.

² Brit. Med. Jour., Nov. 14, 1903.

³ Med. Rec., Jan. 23, 1904.

The fuse wire connected to the outlet should be capable of carrying at least 6 ampères. To produce the arc the push-button on the handle is moved forward until the terminals are in contact, and then brought gently back to permit the arc to form. The arc may be broken at any moment by simply blowing it out as one does a candle, and this should always be done *before* turning off the current at the wall socket. The tube that projects from the front of the lamp carries a quartz plate, and is left open purposely at the sides to permit a free circulation of air.

Eosin Stains and Phototherapy.—Dreyer¹ (Copenhagen) reports some interesting experiments in connection with the eosin stains when

combined with the Finsen light.

He found that the addition of a very small amount of erythrosin to the culture-mediums of bacteria caused a very much greater sensitiveness on their part to the yellow and green rays, which were otherwise ineffective. The action may take place through a thick layer of skin, and he recommended injection of sterile solutions of this fluid by the Schleich method in order to render the deeper tissues accessible to the Finsen rays. Neisser and Halberstädter² previously made some practical experiments with the procedure. They treated 25 cases of lupus, scrofuloderma, tuberculous lymph-glands, and skin cancer. A solution (0.1 % to 1 %) of erythrosin in sterile (85 %) salt-solution was injected as deep as the effect was desired. In from 2 to 5 hours later the Finsen light was applied and the results

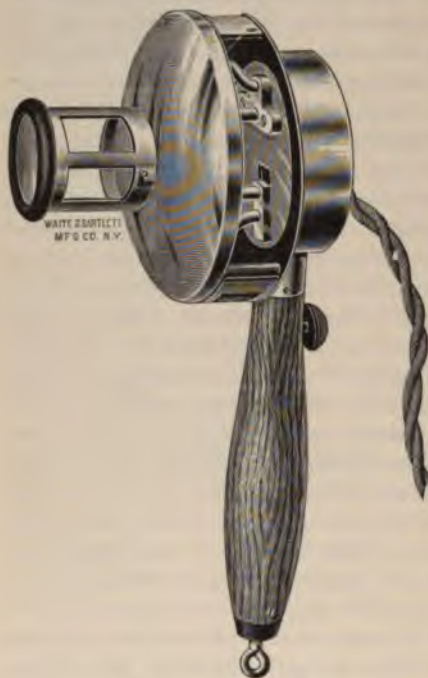


Fig. 7.—Piffard's lamp.

obtained were in accord with the claims advanced by Dreyer.

Treatment of Cancer, Lupus, and other Malignant Growths with Concentrated Sun's Rays.—O. V. Thayer,³ more than 30 years ago, began this form of treatment on diseases of the skin and its appendages. He has operated more than 2000 times with the concentrated sun's rays, and has never noticed any permanent injury from them. In the treatment of cancer and lupus the remedy is at once safe and certain. Fewer treatments are required than with the röntgen rays, the cure is more certain, the wound remaining heals sooner, and the skin is restored in great measure to its normal condition.

¹ Abstr. Med. News, June 25, 1904.

² Deut. med. Woch., Feb. 25, 1904.

³ Abstr. Med. Rec., Nov. 7, 1903.

Blue Light Treatment.—I. E. Schmidt¹ (Chicago) speaks favorably of the use of blue light in the treatment of certain skin diseases. The apparatus he employs consists essentially of an arc-lamp, back of which a reflector is placed. A resistance-box should be employed whenever the street current is used, in order to regulate the constancy of the light, which should be 5000 candlepower for this purpose. The reflector concentrates and throws the light on a large screen of blue glass. The height of the screen can be regulated so that the desired parts of the patient, placed behind it, can be readily exposed. It is unnecessary to protect the parts not under treatment by metal sheets, as there are no untoward effects noticed from the treatment. The distance of the patient from the lamp varies from a few inches to a foot, according as to whether or not the heat-rays are to be employed. The duration of the exposure varies from a few minutes to a half-hour. Applications may be made daily or twice daily without bad results. The spectroscope should show absorption of the yellow and red bands by the Cobalt glass screen, while blue, violet, and ultraviolet pass through. The actinic action of the blue rays is less than that of the ultraviolet rays. Schmidt employed this treatment in 9 cases—2 of lupus vulgaris, 2 of acne vulgaris, 2 of eczema, 1 of carbuncle, and 2 of ulcer, with marked improvement, and recommends it on account of its simplicity, the ease with which it may be handled, the absence of bad effects, and its cheapness.

Light Therapy.—Kellermann² records the histories of several cases of neuralgia and eczema in which excellent results were obtained from exposure to dark-blue, incandescent light. The duration of each sitting is about 15 minutes, and there should not be more than 4 a week. He believes that the beneficial effect is due chiefly to the action of dry heat, and that the chemic or specific action of the light-rays plays a very subordinate part in producing the result.

High-frequency Currents in the Treatment of Skin Diseases.—Charles W. Allen³ (New York), in a well-written article covering the nature, manner of production, method of application, means by which the action is accomplished, and the therapeutics of high-frequency currents, states that since November, 1901, he has employed this method of treatment with satisfactory results in 175 cases, of which 37 were acne, 26 alopecia, 27 eczema, 8 pruritus ani, 8 pruritus vulvæ, 2 generalized pruritus, 5 pityriasis rosea, 3 urticaria, 4 lichen planus, 1 mycosis fungoides, 3 zoster, 3 rosacea, 2 pruritus hiemalis, 1 pruritus scroti, and the remainder scattered cases of psoriasis, chloasma, ichthyosis, keratosis pilaris et follicularis, warty growths, moles, erythema nodosum, molluscum contagiosum, scabies, dermatitis, dermatalgia, ulcers, and others. The chief benefit to be derived from its use in dermatology is, in his opinion, in those cases accompanied by marked pruritus, pain of neuralgic character, and in the various paresthesias. He therefore employs it in chronic eczema, lichen planus, zoster, and other affections attended by sensory disturbances. While high-frequency currents are of decided

¹ Jour. Am. Med. Assoc., Feb. 27, 1904.

² Cent. f. d. gesammte Therapie, 1904, No. 1, p. 16. ³ Med. Rec., Feb. 20, 1904.

advantage in dermatology, he believes they should be employed in connection with other measures. They are inferior to the röntgen ray, but as adjuvants they are at times of decided benefit.

Treatment of Lupus and Malignant Growths by High-frequency Sparks.—H. Strebel,¹ in a report on his method of treating lupus by continuous, high-tension, high-frequency sparks, states that he believes this method of treatment causes a molecular disintegration of the growth. Since modifying his method he has obtained most excellent results. He uses a large induction machine, such as is employed for röntgographic work; the secondary current is directed to the usual primary solenoid, and thence to a properly constructed resonator. The sparks obtained from his apparatus flow almost continuously, and as soon as the electrode is approached to the skin of the patient, long sparks pass. These are of no value, but the sparks which he uses are obtained when the point of the electrode is within 1 mm. or 2 mm. from the skin. After about 5 seconds a white spot appears on the treated portion of the skin, the epidermis becomes raised, at times cracks, and any visible bloodvessels disappear. He applies the sparks for about 10 to 25 seconds. The resultant inflammation is circumscribed and lasts for 3 weeks, and resolves in the formation of smooth cicatricial tissue. He claims to have obtained excellent curative and cosmetic results not only in lupus vulgaris and lupus erythematosus, but also in acne rosacea and nevus.

RADIUM.

Physical Properties and Medical Uses of Radium Salts.—F. H. Williams² (Boston), in considering the physical properties of radium salts, states that for practical purposes the strength of a given specimen of radium may be roughly measured by its power to penetrate iron. The chlorid and bromid only are available for use, metallic radium being unstable in the air. Radium has 5 properties that especially deserve notice: (1) It maintains a temperature above its surroundings under thermal insulation. (2) It is luminescent. (3) It is a spontaneous source of electricity. (4) It gives out 3 kinds of rays, named by Rutherford alpha, beta, and gamma. (5) It produces in surrounding objects that which Mme. Curie has termed "induced radioactivity." The alpha rays constitute the largest part of the radiation. They are easily absorbed and are slightly deflected by a strong magnetic field. The beta rays are not so easily absorbed and they are more strongly deflected by the magnetic field than the alpha rays. The gamma rays are the most penetrating of the 3 kinds. They are not deviated by the magnetic field. The emanation, which is thought to be a gas, imparts radioactivity to objects brought within the neighborhood of the radium salts. The radium rays, unlike the röntgen rays, cannot be used for diagnosis or prognosis, either by means of radiographs or of the fluorescent screen, on account of their inability to show differentiation between the tissues. The use of radium salts for therapeutic purposes requires care and experience, as in handling

¹ Abstr. Brit. Med. Jour., Mar. 5, 1904.

² Med. News, Feb. 6, 1904.

the röntgen ray. The method of employing radium is simple. If strong action of the radium is desired, the metal box containing the salts is placed on the part to be treated. In any case the box should first be covered with a thin rubber cot, which can be easily removed and a new cot used for each patient. If a weaker action is indicated, the capsule is placed at a greater or less distance, according to the needs of the case. The duration of the exposure varies with the case. Exposures should not be made daily: 2 or 3 times a week seems to be the safest procedure. Pure radium bromid is none too strong for the work to be accomplished in certain cases. Williams reports 42 cases treated by this method, 9 of which were diseases of the skin, namely, 1 case of acne, 2 each of eczema and of psoriasis, and 4 cases of lupus vulgaris. The action of the radium in all was satisfactory, and in the lupus cases was far more prompt than the röntgen ray. His conclusions are: (1) Certain diseases promise to yield more readily to treatment by radium and others to the röntgen rays. (2) A disease that has attacked different parts of a body of a given patient may be better treated in certain regions by radium and in others by the röntgen rays. (3) It is quite possible that in some cases the two remedies used together on the same area, and at the same sitting, may accomplish better results than either alone.

Williams,¹ in a later paper, in a comparison between the therapeutics of röntgen rays and the rays from the salts of radium, concludes: (1) The rays from radium salts, unlike the röntgen rays, are not serviceable in diagnosis either by means of radiographs or of fluoroscopic examinations. (2) The beta rays are useful as a therapeutic agent in certain skin diseases and newgrowths if the diseased tissues are superficial or are not more than about 1.25 cc. (one-half inch) below the surface of the skin or accessible mucous membranes. (3) The beta rays from radium will heal some cases of new growths that are not healed by the röntgen ray, and they act more promptly, but not over so large a surface at one time as the röntgen ray. (4) Radium salts of an activity of 8000 or considerably more are not sufficiently strong to be efficient. Pure radium salts, which have a radioactivity of about 1,500,000, are not too strong for the work to be done. (5) The radiation from radium, unlike that from the röntgen-ray tube, is uniform.

J. Mackenzie Davidson,² in a clinical report of 5 cases in which this substance was employed, states briefly some of its physical properties. In the solid state it gives off 3 kinds of rays: *Alpha rays*, minute material particles propelled at an enormous velocity, and which, if they impinge on a suitable fluorescent screen, cause brilliant scintillations. The glass tube in which the radium is inclosed cuts off all these rays, so that their action in the cases presently to be described was *nil*. *Beta rays*, similar to the kathodal rays from a Crookes' tube, but having a much higher velocity, and consequently have the power of penetrating the glass tube and our tissues to some considerable depth. *Gamma rays*, resembling in some respects röntgen rays of extraordinary penetrating power, somewhat similar to the rays produced by an extremely high Crookes' tube.

¹ Boston M. and S. Jour., Feb. 25, 1904.

² Brit. Med. Jour., Jan. 23, 1904.

The glow on a barium platinocyanid screen from a 5 mg. tube can be seen through half an inch of copper. Davidson used radium in 3 cases of rodent ulcer, 1 of tuberculosis verrucosa cutis, and 1 of malignant degeneration of a mole. In 4 cases cure was effected; in one of rodent ulcer the process was arrested. Radium was also tried in carcinoma, without an effect, and he concludes that with the present method of application it is of no use whatever in this condition. He also remarks that thorium gives off emanations and rays the same as radium, but about 1,000,000 times weaker. The hydroxid of thorium can be obtained in any quantity and at a moderate price. A large quantity can be inclosed in a rubber bag and thus applied. He suggests alternating it with radium.

Radium and Its Therapeutic Possibilities.—Wm. A. Pusey¹ (Chicago), in an elaborate paper recently presented, reaches the following conclusions regarding the therapeutic properties of radium: Radium produces effects upon the tissues closely analogous to, if not identical with, those produced by röntgen rays. The indications, accordingly, for its therapeutic uses are along the same lines as those for röntgen rays, viz., in certain inflammatory diseases of the skin, like eczema, psoriasis, lupus erythematosus, and lichen planus. In certain bacterial diseases of the skin, like acne, sycosis, lupus vulgaris, and blastomycosis. In certain diseases where we wish to cause destruction of tissues of low resistance, as in lupus vulgaris, carcinoma, and sarcoma. These are exactly the indications for the therapeutic use of röntgen rays, and future experience alone can determine which of the two agents will prove of the greater practical value in meeting these indications. In some respects he believes radium will prove superior; in the far greater number it seems to him that röntgen rays will have the larger field of usefulness. In the treatment of lupus and cutaneous carcinoma we have sufficient experience to give us a fairly accurate technic in the use of radium. It is probable that Becquerel rays will be efficient only to a very limited depth. On account of lack of depth of effect it is not likely that radium will be as effective as röntgen rays against lesions of more than half an inch in thickness or subcutaneous in situation. Becquerel rays have theoretic advantages over röntgen rays in the accuracy of dosage which will be possible after we have obtained experience in their use. They also have advantages in their ease of application at inaccessible points. They have a disadvantage in the relatively small quantity of energy available, and in the limitation accordingly of any single efficient exposure to a very small area. It supplements and it may add materially to the methods now at our command for using actinic radiant energy in therapeutics. If it becomes less expensive and obtainable in relatively larger quantities, it may supplant to a limited extent the use of röntgen rays and ultra-violet light, although in Pusey's opinion this is not probable. At the present time it is not an entire substitute for either of them, and is to a very great degree less efficient than röntgen rays in its general therapeutic usefulness. Finally, the therapeutic possibilities of radium have, in his opinion, been overstated rather than understated in the foregoing estimate.

¹ Jour. Am. Med. Assoc., July 16, 1904.

J. Macintyre¹ (Glasgow) states that in the case of radium, as in other branches of electrotherapeutics, we have not yet any record of great improvement or cure in any case of serious malignant disease situated deeply in the tissues or within the great cavities of the body. Any records of results so far obtained have been in the superficial parts or within the accessible cavities. As there is no standard measurement by which dosage may be regulated in this form of therapy, experimenters must fall back on: (a) The physiologic effects when applied to the tissues of the normal subject, which involves discomfort and risk; (b) the action upon photographic plates; (c) the fluorescence upon a suitable screen; and (d) the power to discharge the electroscope. Another difficulty encountered in the use of radium is the difference in the emanations and their respective properties. The beta rays are believed to have most to do with the results obtained. He cites a case of epithelioma of the nose which was exposed to radium (10 mg.) for 39 sittings, varying in duration and distance of the radium from the patient without any effect. Thirty-seven applications of the röntgen ray over a period of 5 weeks resulted in apparent cure.

Jumon² states that after radium rays have been applied for 5 or 6 days in lupus the surfaces treated become reddened, and after prolonged application an appearance resembling a second degree burn or an ulceration may be produced. These ulcers are whitish or yellowish, shallow, not indurated, painless, and slow to heal, but may be greatly benefited by wet boric acid dressings. If the application of the rays has been too short, the ulceration produced is too superficial, and recurrence of the original lesion is likely to take place. Permanent cure follows the application of "plaques" of radium of an intensity of from 5000 to 19,000 for from 24 to 36 hours. Such a treatment results in a white, flexible, pearly cicatrix, sometimes surrounded by a zone of brown pigmentation.

Scholtz,³ from the results of a series of experiments with 25 mg. of radium bromid, is convinced that this substance is effective in the treatment of certain skin diseases. The rays emitted by radium resemble in some respects those of concentrated light, and their effects are similar to those of the röntgen ray. The effect on new growths, such as lupus and epithelioma, was especially gratifying. In commenting upon this means of treatment Scholtz declares that even were the effects of it no greater than other radiotherapeutic measures, the convenience with which it may be applied commends it to consideration. S. W. Goldberg and E. S. London⁴ have also detailed an account of some experiments with radium. In one instance a burn was produced by fastening a box with a mica covering containing 75 mg. of radium on the arm and allowing it to remain undisturbed for 3 hours. Four days later a red area developed at the site of the exposure. Fourteen days later a necrotic ulcer was formed. Other similar ulcers formed on the arm, chin, groin, and hand, all of which became necrotic. In 2 cases of rodent ulcer of the nose and cheek weekly

¹ Brit. Med. Jour., Dec. 12, 1903. ² Revue de therap., 1903, No. 20, p. 692.

³ Deut. med. Woch., Berlin and Leipsic, vol. xxx, No. 3.

⁴ Dermat. Zeit., Berlin, vol. x, No. 5.

half-hour exposures resulted in perfect healing at the end of 2½ months. In one case (4½ hours' treatment) only a depressed, light-colored area marked the site of the original condition.

Halkin¹ experimented with Becquerel rays on the skin of guineapigs and young pigs, the results of which are very interesting. Following exposure, mild inflammatory reaction resulted, and at the end of 20 days ulceration was produced. The experiments were very extensive, and their results showed that the epithelium, connective tissue, and blood-vessels were affected simultaneously. In one case of lupus in which these rays were used no effect was produced except on the superficial layers of the skin.

J. H. McLeod,² before the London Dermatologic Society, exhibited a case of lupus verrucosus of 13 years' duration in a boy 14 years of age, which had been treated by exposure to radium and had improved. The lesion had been subjected to exposure to a tube containing 5 mg. of radium bromid of about 600,000 activity. The tube had been applied to the skin in a metal tray for half an hour twice a week, and later 2-hour exposures were made. The radium rays produced marked improvement in the diseased area and likewise produced a halo of erythema of a purple tinge around the patch. Itching and burning accompanied this slight reaction, and after long exposure a mild degree of pain was present.

L. D. Bulkley³ reports a case of lupus vulgaris in which radium was employed, but without effect, on the diseased structure. The patient was 14 years of age and the lesion had existed since infancy. Fourteen exposures to radium were made, each lasting from 5 to 6 minutes, gradually increasing until the duration of the last 2 was half an hour each. The exposures were made every other day, without any effect on the lesion.

Therapeutic Value of Radium and Thorium.—J. M. H. MacLeod⁴ (London) employed radium having a radioactivity of about 600,000 units (taking the activity of uranium as a unit) for periods of 10 minutes each in lupus verrucosus, lupus vulgaris, rodent ulcer, and inoperable carcinoma, with gratifying results. He concludes from his experience with this mode of therapy that its chief utility is in the treatment of rodent ulcer. It is also of value in cases of rodent ulcer, which, having been treated by the röntgen ray, after a time develop a tolerance for the röntgen ray. He regards it of little value in epithelioma, but thinks that in uterine cancer it may prove a valuable adjunct to the surgical treatment. While of value in lupus vulgaris, it is not at present a practical mode of treatment. In lupus erythematosus its value seemed to be negligible. Thorium was also tried by this observer in 2 cases of lupus vulgaris, but its effect was inappreciable.

¹ Arch. f. Dermat. u. Syph., 1903, lxxv, p. 201.

² Brit. Jour. of Dermat., Jan., 1904.

³ Jour. Cutan. Dis., Feb., 1904.

⁴ Brit. Med. Jour., June 11, 1904.

MATERIA MEDICA, EXPERIMENTAL THERAPEUTICS, AND PHARMACOLOGY.

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[THE important event in therapeutics is the approaching publication of the new revision of the United States Pharmacopeia and date upon which it becomes authoritative. During 5 years the Revision Committee have worked diligently, and it represents the best of the medical and pharmaceutic experts. Aside from minor improvements, the valuable newer acquisitions to materia medica have been introduced, higher standards of purity and eligibility have been insisted upon, and a thoroughly up-to-date nomenclature adopted. For the first time doses in the metric system with their approximate ordinary equivalents have been introduced. If the physician will study this official work, which is the law, he will be impressed by the resources of which he will avail himself and become less dependent upon inspired statements in regard to impossible mixtures and improbable formulas. The American Therapeutic Society, at its meeting in New York in May, presented a symposium upon anesthesia and one upon antiseptics, both medical and surgical. The conclusions are authoritative. The continued brilliancy of its work augurs well for safe and sound therapeutics. Evidently the credulity of the physician has been overtaxed, for the flood of synthetics and miracle-working remedies has sensibly abated. Further experience is placing some remedies and measures upon a firmer foundation; others are passing into oblivion. In the succeeding pages a concise and comprehensive review appears. Particular attention is called to adrenalin, alcohol, and formaldehyd as showing recent and valuable extension of our knowledge. Of the serums, the antistreptococcic, in spite of adverse reports, is gaining confidence. Scopolamin-morphin narcosis is very much *sub judice*. The reports on radium, actinotherapy, and the röntgen ray are extensive and in the main convincing. There is much concerning digitalis that is new. The experiments of Crile on blood-pressure have resulted in new opinions which will be found in various places in this review under drug-headings. Some confirm previous theories; others are obviously incorrect in part and need revision. They are all, however, of much interest and should receive attention. So much has been accomplished during the past year that no introductory summary can adequately present therapeutic progress. We therefore ask the reader to give his attention to the entire section.]

Actinotherapy.—Excellent reviews of the work recently done in actinotherapy have been presented by J. F. Schamberg,¹ H. J. Stewart,² J. MacIntyre,³ W. S. Gottheil,⁴ and C. W. Allen.⁵ Schamberg states that röntgen rays and Finsen light differ very markedly in their action upon tissues. Concentrated actinic rays produce, in the course of a number of hours, a distinct reaction, usually characterized by erythema and vesiculation. The blistered areas heal up in about a week. Areas of skin that have been repeatedly treated gradually become less sensitive to the influence of the light, and require a longer exposure to produce blistering. There is but superficial penetration of this light, and subcutaneous tissues are not affected by it. A distinct bactericidal influence is exerted. Signs of improvement may be observed at an early date—usually upon the subsidence of the reactive inflammation. On the other hand, with the röntgen rays, no immediate reaction is observed in the treated area; the effect of the rays is, however, cumulative, the parts treated becoming progressively more susceptible to their influence. The rays penetrate deeply, acting not only upon the skin, but also upon subcutaneous and visceral structures. Improvement is comparatively slow in making its appearance; it may continue for a long time after the cessation of the treatment. Curative changes may take place without any inflammatory reaction being produced. No direct bactericidal influence is exerted, but tissues are fortified against the invasion of bacteria. Schamberg concludes that the Finsen light is generally recognized as constituting the best known treatment of lupus vulgaris. In order to secure the best results, it is necessary to employ the large lamp used by Finsen. In lupus erythematosus the Finsen light in his hands has effected some improvement, but no cures. The röntgen rays should be given preference over Finsen light in lupus vulgaris when the nodules are ulcerated, when the mucous membrane of the nose, lips, or mouth is affected, and probably also in the hypertrophic and vegetative forms of the disease.

MacIntyre states that the chief drawback in the use of the Finsen light is the long time required to effect a cure, but notwithstanding this many prefer it to the röntgen-rays in lupus, rodent ulcer, and malignant disease. The best results are undoubtedly obtained with the large lamps, Finsen himself claiming that his results are better than others because of his use of large lamps and his attention to details. MacIntyre believes, however, that the most striking results in the diseases mentioned have thus far been obtained by the röntgen rays, and these he unquestionably advocates when only one method can be conveniently used. Allen concludes that in the majority of cutaneous affections the röntgen ray is of greater utility than either the actinic or high-frequency methods. In lupus the Finsen method, though tedious, is efficacious; in cancer it is less beneficial than the röntgen ray.

R. H. Stevens⁶ believes that in superficial skin diseases which are

¹ Amer. Med., Dec. 19, 1903.

² Boston M. and S. Jour., Jan. 7, 1904.

³ Brit. Med. Jour., Apr. 23, 1904.

⁴ Jour. Am. Med. Assoc., Mar. 19, 1904.

⁵ Jour. Am. Med. Assoc., July 30, Aug. 20, 1904.

⁶ N. Y. Med. Jour., Aug. 20, 1904.

suitable for Finsen treatment there is no more effective and speedily curative agent known. He protests against the common practice of denominating as Finsen lamps any kind of a phototherapeutic lamp, the construction of which may involve few or none of the principles enunciated by Finsen.

G. G. Hopkins¹ believes that in the combined use of the Finsen light and the röntgen ray, the principal dependence being upon the Finsen light, he has devised the most satisfactory method at present known for the treatment of uterine cancer. Leredde and Pautrier² report 43 cases of lupus vulgaris treated by the Finsen light; of these, 8 were cured, 7 were almost cured, and 28 were still under treatment. Carle³ reports 19 cases of lupus treated with Finsen light; in 6 there was a permanent cure, in 3 improvement was sufficient to warrant cessation of treatment; in 6 relapses occurred in from 3 to 8 months, and in 4 there was absolute failure. He holds that with the sole disadvantage of expense the Finsen light leads as a therapeutic measure in lupus. C. M. O'Brien⁴ has also obtained highly satisfactory results in the treatment of lupus with the Lortet-Genoud lamp. Bieling⁵ recommends the use of light as a stimulant to the healing of wounds, especially those in which there are large defects in the skin. He reports 2 cases in which rapid healing occurred under the use of phototherapy. H. v. Tappeiner⁶ finds that painting the tissues to be exposed with a 0.1 % to 0.01 % solution of eosin enhances the action of light. Very good results were obtained from this method of treatment in lupus, epithelioma, rodent ulcer, and venereal warts. The good effects are attributed to the fluorescence excited in the eosin by the rays of light. H. Strebel⁷ has devised an apparatus ("electrophotocautery") by which the rays of arc light are focused on the skin strong enough to burn it. He asserts that moles, warts, and angiomas are rapidly destroyed by this action; and that chaneroids, syphilitic ulcers, lupus, and acne are speedily cured. He recommends the "photoburn," as he terms it, as an adjuvant to Finsen light, with which it may be associated to shorten the course of treatment. Strebel has also devised an apparatus for applying phototherapy to inaccessible cavities.

Adonidin.—R. W. Wilcox⁸ concludes, from a clinical study of the action of this drug, that it seems to have a field of usefulness which is not entirely filled by digitalis. This is apparently in promptitude of action and the possibility of long-continued use without danger of cumulative effects or liability that the patient will become accustomed to the drug. The objection is that the irritation which it causes may sometimes prevent long-continued use. Bearing in mind that the condition of the myocardium, valves, and arteries must determine the value of a drug in a given case of heart-disease, Wilcox believes that the conditions in which adonidin may be used with advantage are mitral and aortic insufficiency,

¹ Brooklyn Med. Jour., Dec., 1903.

² Phototherapie, Paris, 1903.

³ Lyon méd., Mar. 20, 1904.

⁴ Dub. Jour. Med. Sci., Aug., 1903.

⁵ Balneolog. Cent., Nov. 16, 1903.

⁶ Münch. med. Woch., 1903, l, No. 47; and 1904, li, No. 19.

⁷ Dermat. Zeit., 1904, xi, No. 1.

⁸ International Clinics, vol. i, 1904.

dilation, arrhythmia, precordial pain, and the symptom-complex known as tobacco heart. In fatty degeneration, pericarditis, simple and compensatory hypertrophy, it may be safely administered when digitalis, if given at all, must be used with great caution.

Adrenalin.—R. Klapp¹ has studied the inhibitory effect of adrenalin on absorption. He injected dogs with milk-sugar, determined the amount that had been absorbed, and then compared the results with those he obtained when adrenalin was injected with the milk-sugar. He found that even a single drop of the 1:1000 solution had a decided effect in preventing absorption. A. Exner² has found, from experiments on rabbits, that adrenalin considerably retards the absorption from the peritoneum of such substances as strychnin, potassium cyanid, indigo, and physostigmin, but not of potassium iodid. Further experiments showed that it is the absorption through the lymphatics, which is retarded by adrenalin, potassium iodid and certain other substances probably entering the blood directly by osmosis. Exner suggests that in operations for peritonitis material benefit might be derived from previously injecting adrenalin into the peritoneal cavity. By this procedure it is thought that the absorption of bacterial toxins during the manipulation of the intestines might be lessened.

H. Braun³ writes that experience with several hundred patients has confirmed his previous assertions in regard to the great value of combining adrenalin with cocain. He warns, however, that such a powerful drug should not be used too freely, not only on account of its toxic properties, but because too large doses induce such intense anemia that it is impossible to ligate the vessels, and, as a result, after-hemorrhage is liable to occur. According to Braun, a good combination is from 2 to 5 drops of the 1:1000 solution of adrenalin to 100 cc. of a 1 % solution of cocain or beta-eucain. He has never used more than 5 drops ($\frac{1}{2}$ mg.) of adrenalin in any instance. Foissy,⁴ in experiments on guineapigs, was able to inject from 8 to 15 times the toxic dose of cocain when adrenalin was combined with it, without fatal results or even serious symptoms.

F. Gangitano⁵ has used the combination of adrenalin and cocain in more than 100 operations without any inconvenience. Among the operations were resection of the upper jaw, ablation of a large goiter, gastroenterostomy, and complete laryngectomy. He employed a mixture of 1 cc. of adrenalin (1:1000) with 9 cc. of 0.5 % solution of cocain. Barker⁶ also reports 30 major operations in which he employed this method of producing local anesthesia. He recommends a strength of 1 part adrenalin to 100,000 parts of eucain solution. Aronheim⁷ reports a case in which a large abscess developed in a man of 70 years as the result of an injection of adrenalin and cocain previous to amputation of the toe. Neugebauer⁸ has also observed gangrene several times in elderly persons in consequence of the use of adrenalin with cocain. He cautions against

¹ Deut. Zeit. f. Chir., 1904, lxxx, 3, 4.

² Zent. f. Chir., 1903, xxx, No. 38.

³ Riforma Medica, 1903, xix, No. 36.

⁴ Münch. med. Woch., 1904, li, No. 14.

⁵ Zeit. f. Heilk., 1903, Bd. xxiv, Heft 12 —

⁶ Tribune méd., Dec. 12, 1903.

⁷ Lancet, 1903, vol. ii, p. 203.

⁸ Zent. f. Chir., 1903, xxx, No. 51.

the use of this drug in old persons. [The value of adding adrenalin to cocain solutions, a suggestion which appears to have been made first by C. A. Elsberg,¹ will no doubt further increase the growing popularity of local anesthesia for many major operations. In view of the above-cited accidents, however, Braun's caution as to dosage is timely.] B. Müller,² as the result of 70 major operations performed on dogs, strongly recommends preliminary injections of suprarenin directly into the tissues, especially in operations on the liver, for the purpose of preventing bleeding. He asserts that as much as 10 cc. of the 1:1000 solution may be injected without fear of any mishap. Acting upon Braun's conclusion that adrenalin lessens the toxicity of cocain and intensifies and prolongs its anesthetizing power, A. Dönitz³ has made some experiments on cats to prove the truth of these conclusions when cocain is used intraspinally. He found that cats were enabled to bear as much as $1\frac{1}{2}$ grains of cocain after the previous injection of adrenalin, whereas $\frac{1}{4}$ of a grain is usually a fatal dose. He states also that with adrenalin from $\frac{1}{32}$ to $\frac{1}{4}$ of a grain of cocain is quite sufficient to produce anesthesia, even for major operations. A. Bier⁴ has submitted 56 patients to adrenalin-cocainization of the spinal cord and 65 to suprarenin-cocainization of the spinal cord. In 5 of the former and in 6 of the latter anesthesia was not induced by the injections. Not a single mishap occurred in any instance. The operations included 9 resections of the rectum, 8 amputations at the knee, 1 decapsulation of both kidneys, 3 resections of the hip-joint, 11 operations for hemorrhoids, 1 for prostatectomy. Bier is convinced that suprarenal preparations have placed spinal anesthesia upon a perfectly safe basis.

M. Darier⁵ states that adrenalin exaggerates the action upon the eye of the various alkaloids—atropin, eserin, and cocain. It should not be used in corneal ulcerations, but in conjunctivitis and episcleritis it gives good results.

M. H. Schlesinger⁶ has successfully employed adrenalin (6 minims of 1:1000 solution every hour) in 2 cases of gastrointestinal hemorrhage. One patient suffered from hemophilia, the other from purpura. Hemoptysis, on the other hand, was not influenced by the treatment. Graeser⁷ also reports a case of severe intestinal hemorrhage in typhoid fever, in which the bleeding suddenly ceased upon the administration of adrenalin.

B. Voigt⁸ states that he has witnessed the prompt arrest of hemoptysis in 2 patients with tuberculosis after injection of 1 cc. of a 1:1000 solution of adrenalin. E. A. Robinson⁹ also reports 2 cases in which hemoptysis promptly ceased after the administration of from 20 to 30 drops of adrenalin solution every 2 to 4 hours. J. G. Duncanson¹⁰ reports a case of recurrent hemoptysis in which the bleeding appeared to be reëxcited by adrenalin solution (5 drops every hour). [From what is known of the physiologic action of adrenalin it is highly improbable that adrenalin affected the hemoptysis in these cases either for good or ill.] M. Demay

¹ Amer. Med., Mar. 1, 1902.

² Münch. med. Woch., Aug. 25, 1903.

³ Rev. de Therap., 1904, No. 9.

⁴ Münch. med. Woch., 1903, l, No. 30.

⁵ Medicine, 1903, ix, No. 7.

31 M

⁶ Münch. med. Woch., 1904, li, No. 6.

⁷ Münch. med. Woch., 1904, li, No. 14.

⁸ La Sem. méd., 1904, No. 11.

⁹ Münch. med. Woch., 1904, li, No. 15.

¹⁰ Brit. Med. Jour., Mar. 12, 1904.

de Certant¹ recommends the following lotion in prolapsed hemorrhoids: Cocain hydrochlorate, $\frac{1}{10}$ grain; adrenalin solution (1:1000), 30 drops; water, 1 ounce. He claims that this solution, when applied on a pledget of cotton every 3 hours, lessens congestion, checks bleeding, relieves pain, and renders the tumors reducible. In external hemorrhoids de Certant prefers an ointment, $\frac{1}{2}$ ounce of vaselin being substituted for the water.

T. F. Reilly² has applied adrenalin by means of a spray and cotton tampon to the nasal chambers in 10 cases of essential asthma, with relief in all but 2. J. Bullova and D. Kaplan³ claim good results in several cases of asthma from the administration of adrenalin (3 to 6 minims of 1:1000 solution) hypodermatically.

Baccarini and Plessi⁴ have had good results from the use of suprarenal extract in atony of the stomach. They reason that it has the same effect upon the nonstriated muscles of this organ as it has upon the bloodvessels. G. Mancardi⁵ also has found suprarenal extract of value in gastrointestinal atony. G. Moresco⁶ has used injections of adrenalin with success in cases of atony of the bladder with retention of urine. He injected every morning 150 cc. of a 1:50,000 solution, leaving it in the bladder for an hour or more. Subsequently the strength of the solution was increased to 1:25,000.

J. Barr⁷ has employed with marked success injections of adrenalin to prevent the return of effusion in several cases of pleurisy (one cancerous), several cases of ascites, and a case of pericarditis. In pleurisy a dram of the 1:1000 solution was injected into the sac immediately after aspiration. In ascites as much as 2 drams was employed. In one case slight collapse followed the injection into the peritoneum, but Barr does not attribute this to the adrenalin. In ascites from cirrhosis of the liver the results were not so striking as they were in pleurisy, in which condition they were uniformly successful. In the case of pericarditis 40 minims were injected, with the result of collapse. This, however, quickly disappeared upon stimulation, and no further tapping was needed. Barr also recommends the subsequent injection of aseptic air into the pleura and peritoneum, to prevent the development of adhesions.

E. Martin and M. Pennington,⁸ from clinical experience and laboratory researches, conclude that the intravenous injection of adrenalin is the most powerful practicable cardiac and vasomotor stimulant yet presented to the profession. The dilution, on account of the danger of abscess formation, should be at least 1:10,000 when the drug is given hypodermatically, but they think it safe to give 10 cc. of 1:1000 solution in 90 cc. of normal salt-solution. In cases of urgency adrenalin should be given intravenously in dilution of 1:10,000, injected slowly to prolong its effects, and should be pushed up to 100 cc. of the strong solution or until the heart unmistakably responds. D. Eisendrath⁹ reports a case of severe shock in a boy, the result of a crushing injury of both legs, in which rapid

¹ Jour. de méd. de Bordeaux, 1904, No. 20.

² Jour. Am. Med. Assoc., June 4, 1904.

³ Med. Woch., 1903, iv, 393.

⁴ Gaz. degli Osped., 1903, xxiv, No. 98.

⁵ Amer. Med., Nov. 21, 1903.

⁶ Med. News, Oct. 24, 1903.

⁷ Riforma Medica, Oct. 14, 1903.

⁸ Brit. Med. Jour., Mar. 19, 1904.

⁹ Med. Standard, Mar., 1904.

recovery followed transfusion and the hypodermatic administration of adrenalin (5 minims of a 1:1000 solution and then 1 minim every hour for 5 hours).

H. M. Raven¹ reports a case of what appeared to be Addison's disease, in which the patient, although already comatose, was remarkably benefited by the administration of adrenalin (5 minims of the 1:1000 solution gradually increased to 20 minims thrice daily). At the end of 11 months from the beginning of the treatment there was a distinct decrease in the pigmentation of the skin and the patient was able to be about. Boinet² observed marked improvement from subcutaneous injections of a glycerin extract of suprarenal capsules in 6 of 8 patients with Addison's disease. Two others in a more advanced stage of the disease died in from 2 to 4 days after the treatment had been instituted. Boinet warns that suprarenal medication is contraindicated in severe and advanced cases, and that even in the early stages the dose should be very small. E. W. Adams³ tabulates the results of 105 cases of Addison's disease treated with suprarenal extract. The cases are arranged in 4 groups: (1) Cases in which alarming or fatal results were presumably or possibly due to the treatment—7. (2) Cases uninfluenced by or deriving but doubtful benefit from organotherapy—49. (3) Cases in which marked improvement was coincident with the treatment—33. (4) Cases in which permanent benefit apparently accrued from suprarenal feeding—16. From a study of the cases the following conclusions are drawn: There appears to be a certain class of cases in which indubitable benefit results from organotherapy, although in any given case it is impossible to determine the probable response to the treatment. In any given case, selected haphazard, the probability obtains that disappointment will follow the institution of organotherapy, but that probability is distinctly less than that attaching to any alternative method of treatment at present known.

Alcohol.—R. C. Cabot⁴ reviews the accepted facts concerning the physiologic action of alcohol, and presents the following conclusions as the result of his clinical studies of the action of the drug upon the circulation: In 41 patients, mostly cases of typhoid fever, the action of alcohol upon the circulation was *nil*. The same neutrality of therapeutic doses in relation to temperature, pulse-rate, respiration-rate, appetite, sleep, delirium, and secretions (renal and cutaneous) was also observed in 309 patients suffering from a great variety of diseases. These observations are not interpreted as proving that alcohol is either useless or useful in disease. As a narcotic and vasodilator it may have an important place in therapeutics. More important probably than any of the questions investigated so far is the problem of the effect of alcohol upon the power of the sick man's blood to protect him against infection and other harmful influences.

A. Holitscher⁵ believes that alcohol, instead of protecting the proteids from oxidation, rather increases their expenditure. Moreover, alcohol is

¹ Brit. Med. Jour., 1903, No. 2246.

² Bull. de l'Acad. de Méd., 1903, lxxvii, No. 39.

³ Practitioner, Oct., 1903.

⁴ Boston M. and S. Jour., July 23, 1903.

⁵ Prager med. Wch., 1903, 31-33.

a poison for protoplasm and reduces the vital activity of the cells, especially those of high organization. It follows that alcohol is, on the whole, an unsuitable remedy in fevers, since it interferes with the activity of cells in their struggle against toxins and microorganisms. Nevertheless, Holitscher does not condemn alcohol as a medicine altogether. Occasionally, and in minimum doses, it may be permitted as a mild stimulant, besides being useful in collapse.

M. L. Schnyder¹ draws the following conclusions from his studies of the action of alcohol, in the form of Bordeaux wine, upon muscular energy: Alcohol exercises a favorable influence upon muscular force when it is given in small quantity on an empty stomach, but only when, as a result of previous physiologic conditions, the reserve force of the organism is somewhat lessened. This favorable action, however, is below that of food of the same dynamic coefficient. Furthermore, it is counteracted by the paralyzing action of alcohol on the nervous system, which is more or less pronounced. If the organism, as the result of the ingestion of other foods, disposes of sufficient reserve force, alcohol has no longer any value as a producer of force; on the contrary, its paralyzing properties become predominant and cause a progressive diminution of the power to work.

G. W. Crile² has studied the effect of alcohol upon animals suffering from shock or collapse. He found that the immediate effect of intravenous injections of alcohol was usually a decline in the blood-pressure. There was no evidence that the heart beat more forcibly. The usual effect of an average dose of alcohol was the production of further depression.

A. Bickel³ has been unable to demonstrate, by means of the Moritz orthodiagraphic apparatus, any enlargement of the heart in animals from the continued administration of alcohol.

P. Asher⁴ concludes, from an experimental study of the subject, that the antidotal power possessed by alcohol in carbolic-acid poisoning is physical and depends largely upon the state of dilution, but that, in addition, the dehydrating and astringent properties of alcohol also serve to prevent the absorption of the acid. On the other hand, W. J. Robinson⁵ contends that there is a true chemic reaction between the two substances, simple dilution not explaining the neutralizing effect of alcohol, as water, even when used in 100 times the amount, has not the same action. C. S. Hallberg⁶ believes that, in addition to alcohol, camphor has a modifying effect on carbolic acid, and recommends spirit of camphor as being more effective than alcohol in carbolic-acid poisoning. [The ionic theory best explains the antidotal effect of alcohol toward carbolic acid.]

Anesthesin.—This is a compound belonging to the orthoform group of local anesthetics, being chemically the ethyl-ester of paramidobenzoic acid. Dunbar⁷ prefers anesthesin to cocain in producing local anesthesia.

¹ Arch. f. d. ges. Physiol., 1903, Bd. xciii. ² Med. News, May 7, 1904.

³ Münch. med. Woch., 1903, I, No. 41. ⁴ N. Y. Med. Jour., Apr. 16, 1904.

⁵ Jour. Am. Med. Assoc., Dec. 3, 1903. ⁶ Jour. Am. Med. Assoc., Dec. 3, 1903.

⁷ Zent. f. Chir., 1903, xxx, No. 43.

by infiltration. For superficial work he uses the following solution: Anesthesin hydrochlorate, $\frac{5}{8}$ grain; salt, 14 grains; water, $3\frac{1}{2}$ ounces; and for the deeper tissues, anesthesin hydrochlorate, 4 grains; salt, $2\frac{1}{2}$ grains; and water, $3\frac{1}{2}$ ounces.

L. Schliep¹ has found anesthesin efficient in preventing seasickness; 3 or 4 powders of 8 grains each are given during the first hours after sailing, and the dose is repeated for several days, according to circumstances. In the early stage of sickness it may also be given with advantage in doses of from 30 to 15 grains a day, but after vomiting is once established, the drug is without effect.

Anticholera Serum.—N. Murata² has employed dead cholera vibrios in vaccination against cholera, with the following results: Of every 10,000 vaccinated individuals, 6 contracted the disease; of 10,000 nonvaccinated individuals, 13 contracted the disease. Of the former, 42 % died; of the latter, 75 %. He later doubled the immunizing dose, with the result of noting no cases at all among the vaccinated.

R. P. Strong³ has prepared, by autolytic digestion of cholera vibrios in aqueous solution, a serum, which he claims when injected into animals gives rise to bactericidal and agglutinative substances which equal or exceed those obtained from inoculations of virulent living cholera vibrios. An advantage claimed for this vaccine over the living or dead bacteria is the absence of local reaction following the inoculations. [Immunizing by injecting living vibrios, after the method of Haffkine, not infrequently causes considerable local disturbance.]

Antidysenteric Serum.—L. Rosenthal⁴ has prepared a serum by inoculating animals first with dead cultures of bacilli, then with living cultures, and then with the toxins. The mortality in 157 cases of dysentery treated by subcutaneous injections of this serum (5 drams to $4\frac{1}{2}$ ounces) was $4\frac{1}{2}$ %, as against 12 % to 17 % in cases not so treated. Within 24 hours the tenesmus diminished, the blood disappeared, and the stools became fewer.

Antiplague Serum.—C. E. Forsyth⁵ gives his results in 30,609 inoculations with Haffkine's serum in India. Among the 30,609 patients, 329 were attacked by the plague, and the mortality was 15.1 %. In 50 villages having an aggregate population of 44,760 the uninoculated numbered 31,874 and the inoculated 12,886, both classes living under the same conditions. Among the uninoculated, 4.5 % were attacked by the plague, with a case mortality of 45.2 %, while among the inoculated 1.3 % were attacked, with a case mortality of 16.9 %. No ill-effects were observed in the 30,609 inoculations. B. R. Slaughter⁶ and A. Ferrari⁷ also speak favorably of the action of antiplague serum. L. Cairus⁸ holds that Yersin's antiplague serum is both bactericidal and antitoxic, and that it is most efficacious when injected both intravenously and into the substance of the buboes in the early stage of the disease. V. Godinho⁹ writes that Vital Brazil's antiplague serum is proving as effectual as

¹ Deut. med. Woch., 1904, xxx, No. 10.

² Amer. Med., Aug. 15, 1903.

³ Lancet, Dec. 12, 1903.

⁴ Brazil Medico, 1903, xvii, No. 4.

⁵ Zent. f. Bact., 1904, xxxv, No. 5.

⁶ Deut. med. Woch., 1904, xxx, No. 19.

⁷ Johns Hopkins Hosp. Bull., Nov., 1903.

⁸ Therap. Monatsh., 1904, No. 5.

⁹ La Presse méd., 1904, 1, No. 8.

diphtheria antitoxin in diphtheria. The good effects were less marked in the septicemic type than in the bubonic. Pneumonia as a complication was not influenced by the serum. [Brazil's serum is attained by inoculating mules with plague bacilli. These animals bear the injections better than horses, and are said to yield a more active serum.]

Antistreptococcic Serum.—E. Tavel¹ is convinced, from his experimental and clinical experience, that polyvalent antistreptococcus serum may be regarded as a specific against streptococcus infection. He holds that it is not invariably successful, owing to lack of adequate dosage, the difficulty of procuring a serum to fit all cases, and the circumstance that the serum contains only the amboceptors, which stimulate phagocytosis or fasten the complements to bacteria, while it does not contain the complements themselves, which are sometimes wanting in advanced stages of infection. [Tavel's polyvalent serum is obtained by immunizing horses with fresh cultures of streptococci (not previously passed through animals) from various severe infections in man—phlegmon, appendicitis, puerperal fever, erysipelas, etc.]

D. H. Bergey² believes that the immunity conferred against streptococcus infection by antistreptococcus serum is much more complex than that encountered in some other infections, and that it is probable that in this respect the infection by the staphylococcus and pneumococcus is closely related to that of the streptococcus. The small amount of toxin produced in streptococcus cultures indicates that the formation of an antitoxin is of minor importance in the immunity, and therefore Bergey inclines to the view that in streptococcus immunity it is the stimulation of phagocytosis which plays the important rôle, though this is not the sole factor involved.

Menzer³ also believes that antistreptococcus serum acts by producing phagocytosis, and, therefore, if the organism is too weak, it is useless. In encapsulated pus-collections he holds that it is useless without surgical assistance, as it increases the absorption of toxins, but that in acute streptococcemia serum obtained from human streptococci is very useful when given in large doses. F. Meyer,⁴ after experimenting with a number of serums, concludes that Aronson's is the only one which is effectual against streptococcus infections in mice and rabbits, and that it protects by diminishing the virulence of the bacteria, which are then destroyed by phagocytes. [Aronson's serum is obtained from horses that have been immunized with a single variety of human streptococcus, made especially virulent by repeated passage through animals.]

H. Peham⁵ states that not a single death occurred in 24 cases of puerperal streptococcus infection, including one case of peritonitis, in which he employed Paltauf's antistreptococcus serum. With Marmorek's serum, however, his results were not favorable. [Paltauf's serum is obtained from horses inoculated directly with fresh cultures of strepto-

¹ Deut. med. Woch., 1903, xxix, Nos. 50, 51.

² Jour. Am. Med. Assoc., July 23, 1904.

³ Münch. med. Woch., June 23 and 30, 1903. ⁴ Zeit. f. klin. Med., 1903, l, 1, 2.

⁵ Wien. klin. Woch., 1904, xvii, No. 15.

cocci from puerperal and other severe infections in man, with no passage through animals. Marmorek's serum is prepared by immunizing horses with one variety of streptococcus made virulent by passage through animals.]

J. Mackenzie,¹ W. Caie,² and R. Jones³ each report a case of puerperal sepsis benefited by antistreptococcus serum. J. Nydegger⁴ reports a case of severe streptococcus infection following the removal of suppurating glands in the neck, in which antistreptococcus serum appeared to be a factor in bringing about recovery. A. C. Smith⁵ reports a series of cases of smallpox treated with antistreptococcus serum. He concludes that the serum, when used early and in sufficient doses, prevents pus-formation and shortens the course of the disease.

Menzer⁶ reports 19 cases of tuberculosis with mixed infection in which he employed antistreptococcus serum (0.5 cc. gradually increased to 5 cc.) with marked benefit.

T. Horder⁷ reports a case of chronic streptococcus endocarditis in which he used, without success, a serum prepared from the organism obtained from the patient.

M. Walthard⁸ holds that antistreptococcus serum can be effectual only when the organism is able to produce antibodies in sufficient quantity to cope with the number of bacteria present. Consequently, if the streptococci are virulent, the serum treatment inevitably fails after the disease has passed beyond the early stages. Victor C. Vaughan⁹ draws the following conclusions from a critical review of the literature: We must know more about streptococcus toxin than we do, and must be able to prepare a soluble streptococcus toxin before an antistreptococcus serum of value can be prepared. There is no satisfactory proof that any of the antistreptococcus serums now employed by the profession have any therapeutic value.

T. Escherich¹⁰ reports the effect of Moser's serum in 112 cases of scarlet fever. There were no deaths among those who received the injections on the first and second days. In 27 cases injected on the third day the mortality was 7.4 %; in 23 injected on the fourth day it was 17.4 %; in 20 injected on the fifth day it was 30 %; and in the remaining cases the mortality ranged from 33 % to 50 %. Escherich believes that the remedy is especially indicated in very severe cases, and that it should be used early, in large doses. F. Mackie,¹¹ J. von Bokay,¹² and W. Samgen also speak favorably of the action of antistreptococcus serum in scarlet fever. Heubner,¹³ from an experience with the use of various streptococcus serums in 20 selected cases of scarlet fever, states that in no case did he obtain a distinct impression of unquestioned specific healing by the serum, an experience diametrically opposed to that attained in the first

¹ Lancet, Sept. 26, 1903.

² Brit. Med. Jour., Nov. 7, 1903.

³ Med. Rec., Apr. 2, 1904.

⁴ Lancet, July 16, 1904.

⁵ Physician and Surgeon, May, 1904.

⁶ Lancet, Feb. 20, 1904.

⁷ Brit. Med. Jour., Nov. 7, 1903.

⁸ Amer. Med., Aug. 13, 1904.

⁹ Münch. med. Woch., 1903, I, No. 43.

¹⁰ Zeit. f. Geburtsh. u. Gynäk., 1904, li, No. 3.

¹¹ Wien. klin. Woch., 1903, No. 23.

¹² Deut. med. Woch., 1904, xxx, No. 1.

¹³ Berl. klin. Woch., 1904, xli, p. 372.

20 cases of diphtheria he treated with antitoxin. [Moser's antiscarlatinal serum is obtained from horses that have been injected directly with streptococci isolated from scarlet-fever patients.]

G. Sherman¹ reports 9 cases of acute rheumatism in which antistreptococcus serum was used with pronounced success. He states that none of the patients developed heart complications, the disease being cut short before such complications usually occur. M. Menzer² has treated with his antistreptococcus serum 47 cases of acute rheumatism with very good results. From 1 to 2 years have passed since the treatment, and no recurrences have taken place. In only 2 of the 47 cases was the heart involved. A. Schmidt³ has tried Menzer's serum in 15 cases of articular rheumatism. In 6 there was marked improvement; in 4, some relief; and in 5, no effect was apparent. Schaefer⁴ also claims to have obtained good results from the use of Menzer's serum in 6 cases of rheumatism. [Menzer's serum is obtained from horses treated with streptococci isolated from patients with acute rheumatism.]

Antitoxin of Diphtheria.—A. Caillé⁵ advocates an immunizing injection of antitoxin for young children once or twice during the school year (November and February), with the hope of preventing infection from primary diphtheria and of lessening the mortality of the severe forms of scarlatina and measles, a large percentage of which are complicated with diphtheria.

C. Welden⁶ advocates the use of antitoxin at frequent intervals in smaller doses. He gives 2000 units every 3 hours until there is a decrease in the severity of the symptoms. L. Cruveilhier⁷ concludes, from experiments made on guineapigs under similar conditions, that the intravenous route is the best for diphtheria antitoxin. It proved effective in these tests 6 hours after a subcutaneous injection had lost all efficacy. J. Marsh⁸ reports a case in which the injection of 1500 units of diphtheria antitoxin was followed in 10 minutes by epigastric pain, vomiting, numbness, cyanosis, stupor, and a persistent urticarial rash. This, he thinks, was due to an idiosyncrasy of the patient to anything coming from a horse, as she had always been seized with unaccountable sneezing attacks when brought in contact with that animal.

M. Gay⁹ reports recovery in 2 very severe cases of pneumonia, the good results being attributed to injections of diphtheria antitoxin. W. Sizemski¹⁰ has collected 110 cases of ozena and reports 2 additional cases of his own in which diphtheria antitoxin was employed in the treatment. According to him, the majority of the cases were either completely cured or at least greatly benefited. [This treatment is based on the discovery, a few years ago, by two Italian investigators, of bacilli closely resembling diphtheria bacilli in the nasal discharge in cases of ozena.] Del Monaco¹¹

¹ Amer. Med., Oct. 17, 1904.

² La Sem. méd., 1904, No. 18.

³ Berl. klin. Woch., 1903, xli, No. 49.

⁴ Therap. d. Gegenw., 1904, xlv, No. 3.

⁵ Arch. of Ped., Oct., 1903.

⁶ N. Y. Med. Jour., Nov. 14, 1903.

⁷ Ann. de l'Institut Pasteur, 1904, xviii, No. 1.

⁸ Am. Jour. Med. Sci., Dec., 1903.

⁹ Gaz. degli Osped., 1903, xxiv, No. 122.

¹⁰ Roussky Vrach, July 24, 1904.

¹¹ Rev. mens. des Mal. de l'Enf., Aug., 1903.

observed marked improvement in a grave case of aphthous stomatitis shortly after an injection of diphtheria antitoxin.

Antituberculous Serum.—Marzagalli and Figari,¹ working in Maragliano's clinic, have succeeded in extracting from the protoplasm of living and virulent bacilli a substance with which they immunize rabbits, the blood-serum of these animals acquiring high agglutinating and bactericidal powers. Maragliano asserts that he has several rabbits which are immunized to such an extent that they are able to resist endovenous injections of fresh cultures of the most virulent tubercle bacilli. He² has also vaccinated a number of children against tuberculosis, the results being constantly controlled by experiments on animals. The blood-serum gradually acquired agglutinating power up to 1:100, the same as in the animals, and intravenous injections of the animals with virulent cultures of tubercle bacilli demonstrated that they were completely immune against tuberculosis. Maragliano thinks the probabilities are all in favor of the assumption that the children have been rendered similarly immune, though confirmation of the test by inoculation is, of course, out of the question. In vaccinating, the following method is pursued: immunizing substances derived from the blood of immunized animals are first injected; then these substances are injected together with substances derived from the bodies of killed bacilli, and finally products of the tubercle bacilli are injected. After a period of 3 or 4 months the serum has acquired antitoxic, antibacterial, and agglutinating properties. The controls treated step by step in the same way acquire these same properties and prove immune to infection. The dead bodies of the bacilli are believed to be the chief factor; these injected set up a focus of tuberculous inflammation entirely free from live bacilli, and from this focus emanate the influences which induce the antitoxic, antibacterial, and agglutinating properties. In a later communication Maragliano³ states that he has ascertained that a certain degree of immunity can also be acquired by administering the serum by the mouth. He further suggests that immunity might be conferred in a still more simple way—that is, by the substitution of milk from immune cows for ordinary milk. Adult patients with advanced tuberculosis were not materially benefited by injections of serum from immunized animals. Three out of 25 children, however, are said to have been permanently cured. In 4 out of 18 adults in the earlier stages of tuberculosis a clinical cure is said to have resulted from the administration of the serum by the mouth.

A. Moeller⁴ has found it possible to confer upon animals immunity against tuberculosis by injecting them with the bacilli of blindworm tuberculosis. This bacillus was selected because, although effective, it does not produce progressive lesions. After inoculating himself with blindworm bacilli he injected intravenously human tubercle bacilli. Four months later his health remained unaffected, although two guinea-pigs which had not been vaccinated before receiving injections of human tubercle bacilli from the same culture perished within 3 weeks. Moeller

¹ *Gaz. degli Osped.*, xxiv, No. 125.

² *Gaz. degli Osped.*, 1904, xxv, No. 11.

³ *Med. News*, Apr. 2, 1904.

⁴ *Deut. med. Woch.*, 1904, xxx, No. 12.

is confident that in the blindworm cultures we have a means for successful vaccination against tuberculosis, on the same principle that cowpox vaccination protects against smallpox. F. Friedmann¹ has successfully immunized animals against tuberculosis by inoculating them with the bacilli of turtle tuberculosis, which he claims have advantages over bacilli obtained from the blindworm.

Marmorek² claims to have obtained an antituberculous serum of great potency by inoculating horses with a toxin from tubercle bacilli, essentially different from Koch's tuberculin. This toxin is yielded by the bacilli instead of tuberculin, when they are grown on a medium composed of liver bouillon to which has been added a slight amount of glycerin and a leukotoxic serum obtained by injecting the white cells of smaller animals into the calf. A. Latham³ thinks that Marmorek's serum produces a specific antitoxic effect and that some improvement in tuberculous patients results from its use. Klein and Jacobson⁴ also report favorably upon the use of Marmorek's serum. On the other hand, Goldschmidt,⁵ Dieulafoy, le Dentu, and Hallopeau⁶ report unfavorably upon its use. [Favorable reports upon the efficacy of Marmorek's serum should be received with caution, as his former colleagues in the Pasteur Institute have discredited his results.]

Antityphoid Serum.—A. E. Wright,⁷ from his experience with antityphoid inoculation in many thousands of soldiers in the British army, draws the following conclusions: The incidence of typhoid fever was diminished by at least half in the inoculated. The case mortality was less than half that among the uninoculated. The death-rate has often exceeded and seldom fallen below a four-fold reduction. The duration of the protection afforded by inoculation persists during the second and probably during the third year. In order to avoid the constitutional reaction, Wright advises two consecutive inoculations instead of one severe one. M. Einhorn⁸ finds that the serum treatment does not materially shorten the course of typhoid fever, but that it brings about a definite improvement in the symptoms. A. Josias⁹ reports that the average death-rate from typhoid fever among children in Parisian hospitals, where they are treated by cold bathing and drugs, is 14.2 %; whereas in the Bretonneau Hospital, where they are treated by Chantemesse's serum and cold bathing, it is only 4 %.

Antivenin.—Recent researches have shown that while Calmette's antivenin will neutralize the venom of the cobra, which is a neurotoxin, it is without effect on the venom of the rattlesnake, which is a hemorrhagin, destroying the endothelial cells of the bloodvessels and allowing the blood to escape. Heretofore it has been impossible to immunize animals against rattlesnake poison, as the latter has so destructive an action when injected into the tissues; recently, however, Flexner and Noguchi,¹⁰

¹ Deut. med. Woch., 1904, xxx, No. 5.

² Lancet, Mar. 26, 1904.

³ Lancet, Apr. 9, 1904.

⁴ Bull. gén. de Therap., Feb. 29, 1904.

⁵ Deut. med. Woch., Dec. 17, 1903.

⁶ Bull. de l'Acad. de Méd., 1903, lxxvii, No. 39.

⁷ Practitioner, Mar., 1904.

⁸ Med. Rec., Jan. 16, 1904.

⁹ Med. Press and Circ., July 29, 1903.

¹⁰ Jour. of Med. Research, May, 1904.

by treating the rattlesnake venom with hydrochloric acid and iron trichlorid, have been able to inject it into animals and to obtain an antivenin of considerable activity.

Apocynum Cannabinum.—H. C. Wood, Jr.,¹ reports the results of his studies on the action of this drug. He found that it caused a marked elevation of the blood-pressure, with slowing of the pulse; when given in sufficient doses, the slow pulse was followed by an extremely rapid heart-action with a sudden cessation of the heart. The rise of the blood-pressure was due in part to a stimulation of the heart muscle, and also in part to the stimulant influence upon the bloodvessel walls. The slowing of the pulse did not occur after division of the pneumogastric nerve, and was due to stimulation of the cardioinhibitory centers. In the stage of rapid heart-action he found that stimulation of the pneumogastric nerve failed to slow the heart, indicating that the peripheral ends of the nerves were paralyzed. The volume of the kidney was diminished, showing a contraction of the renal bloodvessels. Pawinsky² has also found that the action of Apocynum cannabinum is quite similar to that of digitalis.

Aristochin.—This is a carbónic ester of quinin, said to contain 96 % of quinin. It is a colorless, tasteless powder, soluble in alcohol, hydrochloric acid, and chloroform, but insoluble in water. H. Kittel³ states that aristochin has given him better results in 34 cases of whooping-cough than any other remedy he has tried. The dose was 1½ to 3 grains 3 times a day. K. Dressler⁴ has found that aristochin (6 grains 3 times a day) affords prompt relief in asthma. A. Strass,⁵ while satisfied with the usefulness of aristochin, finds that it frequently produces cinchonism, and concludes, from his experience with it in 15 cases, that it has no advantages over quinin sulfate, except for children, in the absence of the bitter taste.

Arsenic.—W. Türk⁶ states that he has had very promising results in a case of polycythemia with enlarged spleen and pigmentation from the use of arsenic in large doses (up to 30 drops of Fowler's solution daily), kept up for several months. He administered it on the grounds that arsenic checks proliferation of the blood-forming tissues. M. A. Laveran⁷ states that arsenous acid (1 part for each 20,000 of the animal's weight) has given favorable results in sleeping-sickness, and will cause the trypanosoma to disappear, temporarily, at least, from the blood of infected rats.

Aspidium.—Habercamp⁸ reports 2 instances of blindness, 1 partial, the other complete, from the administration, on 3 different days, of 2½ drams and 2 drams respectively of the ethereal extract of aspidium. In each instance the anthelmintic was followed by calomel and not by castor oil. Habercamp believes that the amount of the drug has no bearing on the production of the blindness, as very much larger doses have

¹ N. Y. Med. Jour., June 25, 1904.

² Bull. et Mém. de la Soc. de Therap., Feb. 24, 1904.

³ Jour. de Méd. de Paris, 1903, No. 52. ⁴ Therap. d. Gegenw., Dec., 1903.

⁵ Wien. klin. Rundschau, 1903, No. 50. ⁶ Wien. klin. Woch., 1904, xvii, No. 7.

⁷ La Sem. méd., 1904, No. 9.

⁸ Woch. f. Therap. u. Hyg. des Auges, 1903, vi, No. 38.

been taken without injury. He attributes the blindness to a direct degeneration of the nerve-fibers and not to disease of the retinal vessels. Nagel,¹ having observed 2 cases of blindness from the use of the extract of male-fern (10 grams in one or two doses) in ankylostomiasis, has abandoned this preparation for a nontoxic principle separated from aspidium by Kraft. This principle, which he believes to be the worst expelling element of the crude drug, he calls "filmaron." In 9 cases Nagel succeeded with it after failure with the extract of aspidium.

Aspidospermin.—H. C. Wood, Jr., and D. Hoyt² have found that aspidospermin causes a marked increase in the activity of respiration, the amount of air moved being increased in some experiments as much as 400 %. The respirations were deeper and more rapid. The percentage of carbonic acid expired was slightly reduced, although the total amount exhaled was considerably above normal. Penzoldt's observation that the blood acquired an arterial hue was noted in several, but not in all, of their experiments, and they believe this to be the result of increased respiration and not the cause. Spectroscopic examination revealed no new compound in the blood. The blood in aspidospermin poisoning did not lose its power of giving off oxygen. The blood-pressure was reduced by the drug, probably, Wood and Hoyt believe, by direct action on the cardiac muscle, as they found the vasomotor mechanism was not affected. The experiments were made with commercial amorphous aspidospermin, which contains several alkaloids and probably represents the whole activity of *Aspidosperma quebracho blanco*.

Aspirin.—R. T. Williamson³ has given aspirin in 35 consecutive cases of chorea, and believes that the drug is of distinct service in diminishing the duration of the disease, especially in severe and persistent cases. He commences with 10 grains in powder twice a day, for children over 7 years, and rapidly increases the dose to 10 or 15 grains 4 times a day. Toxic symptoms (noises in the ears, etc.) occurred rarely, but occasionally gastric irritation was produced. Williamson⁴ also reports additional cases of diabetes mellitus (see YEAR-BOOK for 1904) in which he has used aspirin (10 grains twice a day, rapidly increased to 15 grains 4 or 5 times a day) with advantage. He points out that soda-water or alkalis should not be given just after aspirin, as they are liable to decompose it in the stomach. S. S. Cohen⁵ writes that aspirin is capable of producing great cardiac depression in susceptible persons, and great care must always be used in watching its effects and regulating its dosage. A. Borri⁶ reports the case of a man, aged 29, who in 15 minutes after taking 10 grains of aspirin was seized with noises in the ears, dyspnea, vertigo, and vomiting. These symptoms were soon followed by extensive urticaria and marked edema of the face and tongue. Under stimulants the patient made a speedy recovery. As the amount of salicylic acid in the molecule of aspirin is small, Borri attributes the toxic effects of the latter in these cases to the peculiar union of the two acids, salicylic and acetic.

¹ Deut. med. Woch., 1903, xxix, No. 31.

² Univ. of Pa. Med. Bull., Sept., 1903.

³ Lancet, Aug. 22, 1903.

⁴ Lancet, Jan. 23, 1904.

⁵ Amer. Med., Nov. 28, 1903.

⁶ Gaz. degli Osped., Sept. 13, 1903.

Atropin Methylbromid.—A. B. Hale¹ is convinced, from his experience, that this drug in 1 % aqueous solution is a trustworthy mydriatic and a good cycloplegic in refraction; a comfortable mydriatic in corneal inflammations, but an untrustworthy one in iritis. Its action, which is inferior only to atropin sulfate, begins at about the same time as the latter and disappears from 2 to 6 days earlier. Its effects disappear somewhat more slowly than those of homatropin, but from 12 to 24 hours more quickly than those of scopolamin. According to Aronheim,² atropin methylbromid has anodyne properties similar to morphin; applied to the eye, it produces anesthesia analogously to atropin-cocain; it dispels itching accompanying eczematous skin diseases, and has no important by-effects. G. Campanella³ prefers atropin methylbromid to atropin in the treatment of asthma. It affords almost immediate relief, although it induces dryness of the throat and, at times, mydriasis, dimness of vision, and ischuria.

Bitters.—P. Borisoff⁴ concludes, from experiments on dogs, that a small amount of a bitter, acting directly on the nerves of taste, immediately before the ingestion of food, has an unmistakable stimulating effect upon the secretory functions. The average amount of gastric juice secreted in 6 tests without the bitter was 101 cc., while corresponding tests with gentian resulted in an average of 131.1 cc. The stimulant effect, however, was transient and was nullified by large amounts of the drug. To secure the best results, from 10 to 20 drops of the tincture should be taken in a wineglass of water before each meal.

Borax and Boric Acid.—C. F. Dight⁵ concludes, from a series of experiments conducted on guineapigs, that borax and boric acid do not irritate the tissues or impair nutrition, and that in moderate amounts (2 grams daily) they exert no ill effects on the adult body, such as would condemn their use as food-preservatives. On the other hand, C. Harrington⁶ has found, in experiments on cats extending over a period of from 6 to 19 weeks, that borax, in daily doses no larger than a person could receive in food in the course of a day, almost invariably produces lesions in the kidney analogous to those found in subacute and chronic nephritis in man.

C. Best⁷ asserts that, including his own case, there are on record 6 cases of severe boric-acid poisoning, 5 of which resulted fatally. In all these cases the drug had been applied to wounds or to mucous membranes. In Best's case 6 ounces of boric acid had been placed in an inguinal abscess and the wound closed. On the third day the following symptoms developed: A diffuse erythematous and papular rash, cyanosis, cold sweat, uncontrollable vomiting, and, finally, delirium. Death resulted on the third day of the poisoning. Postmortem examination revealed only congestion of the viscera and cloudy swelling of their cells.

Cactus Grandiflorus.—S. S. Cohen² states that for the relief of car-

¹ Ophthal. Rec., Dec., 1903.

² Gaz. degli Osped., Sept. 20, 1903.

³ Northwestern Lancet, July 1, 1904.

⁴ Jour. Am. Med. Assoc., Sept. 17, 1904.

⁵ Med. Woch., 1903, No. 14.

⁶ Roussky Vrach, 1903, ii, No. 32.

⁷ Am. Jour. Med. Sci., Sept., 1904.

⁸ Penna. Med. Jour., July, 1904.

diac pain cactus is perhaps superior to any other remedy of the same therapeutic group, and that a combination of digitalis, adonidin, and cactus is often very useful in cases of threatening rupture of compensation associated with precordial distress. [Considerable discredit as to the value of cactus has arisen from the fact that many commercial preparations are inert.]

Calcium Chlorid.—For more than 2 years I. Boas¹ has been treating bleeding piles with rectal injections of 6 drams of a 10 % aqueous solution of calcium chlorid. The injections, which are painless, are given early in the morning after the bowels have been emptied, the fluid being retained. The hemorrhoids themselves are not affected, but the bleeding is arrested. In only 2 cases, in Boas' experience, did the injections fail, and in one of these success was finally attained by the supplementary administration of hamamelis by the mouth. [The reason for the value of this remedy is to be found in its power to increase the coagulability of the blood.]

Calcium Sulfid.—P. F. Batbourn² states that calcium sulfid ($\frac{1}{2}$ grain every 2 hours for a child of 1 year) has proved more efficient than any other agent in his experience in the treatment of whooping-cough. He calls attention to the fact that most of the calcium sulfid on the market is inert, owing to oxidation. Chocolate, he believes, is a better protective for pills of the drug than gelatin.

Carbolic Acid.—A. Brindley and F. Bonis³ have treated 35 cases of smallpox by penciling the vesicles with pure carbolic acid. Two or three applications were sometimes necessary. The acid is said to penetrate the vesicles, thus disinfecting their contents, and to cause rapid scabbing. Although 22 of the cases were severe, but 5 of the entire number were fatal; 2 of these were complicated with scarlet fever and 1 was malignant smallpox with subcutaneous hemorrhages. J. Neech and J. Hodgson⁴ have used the carbolic-acid treatment in 136 cases of smallpox, with 5 deaths. Of the cases, 22 were confluent and 12 semiconfluent. The treatment is said to have allayed irritation, caused rapid scabbing, diminished the odor, and prevented secondary fever. There were no complications in the series.

J. C. Thompson⁵ (Hongkong) states that he has found carbolic acid in heroic doses more useful in plague than any other remedy thus far tried. He gives 144 grains a day, divided in bihourly doses of 12 grains each. When taken well diluted, these large doses caused no disturbances. Poisoning was never observed, and in only a few cases was there carboloria. E. D. Kremers⁶ reports a case of gangrene in a boy, the result of the application, for 48 hours, of a 5 % solution of carbolic acid. G. E. Shoemaker⁷ reports 2 similar cases. [The fact that carbolic-acid solutions of any strength applied as moist dressings are dangerous cannot be too strongly emphasized. In 1900 Harrington cited 18 cases of gangrene

¹ Therap. d. Gegenw., 1904, xlv, No. 7.

² Bull. of Kentucky State Med. Assoc., Oct., 1903.

⁴ Lancet, Dec. 26, 1903.

⁶ Jour. Am. Med. Assoc., Aug. 27, 1904.

³ Lancet, Oct. 24, 1903.

⁵ Jour. of Trop. Med., Oct. 1, 1903.

⁷ Amer. Med., July 9, 1904.

from this cause that had come under his own observation, and was able to collect 114 additional cases from the literature. In only a few of the cases did the strength of the solution exceed 5 % of carbolic acid.]

H. C. Fairbrother¹ calls attention to the fact that a combination of carbolic acid and nitric acid is dangerously explosive. He reports an accident that occurred to him from mixing half a dram of each of these substances.

Chloroform.—Tunnicliff and Rosenheim² and O. Loeb,³ from a series of experiments on the isolated mammalian heart, have confirmed the findings of Sherrington and Sowton (see YEAR-BOOK, 1904) that the depressant effect of chloroform on the heart depends entirely on the concentration in which it is used and not at all upon the absolute amount that is passed through the organ. The former found that chloroform stopped the heart when perfused in a concentration of 0.1 %; the latter, when it was perfused in a concentration of 0.084 %. F. Guyon⁴ does not regard kidney disease as a contraindication to chloroform. He holds that the kidneys are more or less quiescent during chloroform anesthesia, and that the anesthetic is eliminated almost entirely in the exhalations. A. B. Green⁵ states that the further use of chloroform in the preparation of vaccine-virus has confirmed his original opinion as to its great efficacy in destroying extraneous microorganisms.

Cinnamic Acid.—G. Brasch⁶ states that his experience with hetol (cinnamic acid) in the treatment of 52 patients with tuberculosis during the last 4 years has been extremely favorable. R. Blum⁷ also speaks well of Landerer's hetol treatment in cases of incipient phthisis.

Cocain.—E. G. Mark⁸ concludes, from his own experience with spinal subarachnoid cocainization and from replies to inquiries sent to the most extensive users of this method of producing analgesia in America, that the method is as safe as, if not safer than, general anesthesia; that we may safely employ a dose up to 0.48 grain of cocain without fear of toxic effects; that shock, when present, is decidedly less than with general anesthesia; that annoying sequels are less likely to occur; and that, on account of the variability in the duration of the analgesia, the method is contraindicated in prolonged operations. [See also adrenalin.]

Collargol.—This is an allotropic form of silver, discovered in 1889 by Carey Lea, and introduced into medicine in 1897 by Credé.

Netter and Salomon⁹ speak of the usefulness of collargol in infectious diseases both by intravenous injection and by inunction. They believe that it should be resorted to in all serious infections, such as pyemia, septicemia, ulcerative endocarditis, severe scarlatina, cerebrospinal fever, some types of tuberculosis, grave forms of typhoid fever, pneumonia, and rheumatism with vicious tendencies. A. Rittershaus¹⁰ reports remarkably favorable but transient effects on

¹ St. Louis Med. Rev., Apr. 2, 1904.

² Proc. Phys. Soc., Mar. 21, 1903.

³ Arch. f. exp. Path. u. Pharm., 1903, li, 82.

⁴ Ann. d. Mal. Genito-urin., 1903, xxi, No. 22.

⁵ Lancet, May 28, 1904.

⁶ Deut. med. Woch., 1904, xxx, No. 9.

⁷ Monatsh., 1904, No. 6.

⁸ N. Y. Med. Jour., Oct. 31, 1903.

⁹ Clinics, 1904, vol. i.

¹⁰ Therap. d. Geger

the subjective symptoms in infectious and septic processes from the intravenous injection of collargol. In erysipelas, especially the cases with meningitic symptoms, the results were so favorable that he attributes a direct curative influence to the collargol. Rosenstein¹ has had good results from intravenous injections of soluble silver in puerperal sepsis, but holds that the drug does not act by exerting an antiseptic influence, since it has been shown to have practically none. He prefers the intravenous injection to inunction, and injects, by means of a special syringe, 75 grains in the form of a 2 % solution into a vein of the arm. H. N. Vineberg² employs the ointment of colloidal silver (unguentum Credé) in cases of puerperal sepsis when he can find no definite lesion that demands surgical intervention, believing that it is of some service in aiding the system to eliminate the toxins produced, or in some way to counteract their deleterious influence. Several desperate cases in which he employed the remedy ended in recovery. H. Fehling³ is decidedly of the opinion that collargol should be employed in puerperal fever, though he believes that further experimentation is desirable. He injects 2½ to 5 drams of a 2 % solution with a fine needle into a vein at the elbow-bend. Warren Coleman⁴ reports 5 cases of erysipelas treated by injections of colloidal silver (5 cc. to 10 cc. of a 1 % solution), and describes the technic. He is convinced of the harmlessness of the method, and recommends it in appropriate conditions. G. T. Harrison⁵ reports a grave case of pyemia following criminal abortion in which there was effusion in one knee-joint and a gluteal abscess, and another case of puerperal sepsis, in which injections of collargol were used with brilliant results. M. Behr⁶ has used collargol with good results in 14 cases of tuberculosis with mixed infection. He gave a tablespoonful of a 1 % solution twice a day by the mouth, and supplemented this by an ounce of the same solution by the rectum. The average duration of the treatment was 7 weeks. J. Camerer⁷ has found inunctions very valuable as a prophylactic measure in puerperal patients when the conditions are unfavorable for asepsis. He orders 45 grains of the Credé ointment to be rubbed into the legs and back alternately, twice a day, for 30 to 40 minutes. D. L. Edsall⁸ reports a case of chorea of the septic type treated with intravenous injections of collargol, which apparently had a markedly favorable effect upon the temperature and the child's general condition. W. E. Robertson⁹ reports having used unguentum Credé in a case of endopericarditis, with apparent decided success. E. Desanti¹⁰ contributes an article upon the various methods of administering collargol. H. Loeb¹¹ advises the use of collargol by enema instead of by injection or inunction. The technic is very simple; no bad symptoms were observed in any of his

¹ Therap. Monatsh., 1903, 17.

² Jour. Obstet., 1903, No. 9.

³ Münch. med. Woch., 1903, No. 33.

⁴ Med. Rec., Nov. 21, 1903.

⁵ Virginia Med. Semi-Monthly, 1904, No. 20.

⁶ Wien. klin. Rundschau, 1904, xviii, No. 29.

⁷ Therap. d. Gegenw., 1904, xlv, No. 2.

⁸ Annals of Gyn. and Pediat., Mar., 1904.

⁹ Annals of Gyn. and Pediat., Mar., 1904.

¹⁰ Rev. française de Med. et de Chir., 1904, No. 21.

¹¹ Therap. d. Gegenw., 1904, No. 45.

cases, and the results were as good as when one of the older methods was employed. He dissolves $7\frac{1}{2}$ grains of the drug in $1\frac{1}{2}$ ounces of water and injects it twice daily, half an hour after an enema of lukewarm water. A. Guerin¹ believes that collargol has some field of usefulness in the treatment of certain infections, but inclines to the opinion that observers have been, perhaps, oversanguine concerning the drug, and concludes that further and scientific observations upon it are needed. J. M. Fortescue-Brickdale,² from a critical study of the reported cases of infectious diseases in which collargol has been used, and from a series of experiments upon the germicidal power of the drug performed by himself, draws the following conclusions: That collargol has never been introduced into the body in sufficiently large quantities to produce an antiseptic solution in the mass of the blood; that the evidence is strongly against its having any effect on artificial septicemia in rabbits; that so far as the cases studied show, it has not had any effect in proved cases of general pyemia or septicemia in man; that a fall of temperature and improvement in the general condition, comparable to that sometimes produced by antipyretics and hydrotherapy, has been observed in some cases of general toxemia, but that in half the recorded cases admissible as evidence it proved inert. J. Claiborne and E. Coburn³ conclude, from 2 series of experiments undertaken to determine the efficiency of collargol in the treatment of infected wounds of the eye, that the drug has some direct bactericidal action and produces a marked and rapid leukocytosis, but that it is ineffectual in preventing the spread of purulent processes in the eyes of rabbits, whether used intravenously or by injection into Ténon's capsule. J. Bamberger⁴ describes experimental researches and tests on his own person with collargol which show that the silver salts do not remain dissolved in the serum, and that they have no particular bactericidal action. Their unquestionable beneficial action is due, he thinks, to the mobilization of the leukocytes which they induce.

Creasote Carbonate.—J. A. Scott and C. M. Montgomery,⁵ having treated 76 patients with croupous pneumonia, of whom 10 died (14.9 %), with creasote carbonate in doses of 10 to 15 minims every 4 hours, conclude that the mortality percentage does not corroborate the unusually low figures cited by other observers who have used this remedy, nor does it prove that the results were due to the treatment, as equally good results have been secured in past years by other methods in the same hospital. They believe, however, that the study of the action of the drug should be continued, and that larger doses should be given. [The dosage should be markedly increased, when uniformly good results will be obtained.]

Creolin.—S. Rideal⁶ calls attention to the varying composition of this disinfectant as prepared by different manufacturers. Samples of creolin purchased in Brussels, Hamburg, and London have been tested by him

¹ Jour. de méd. de Bordeaux, 1903, No. 52.

² Bristol Med.-Chir. Jour., Dec., 1903.

³ Berl. klin. Woch., Aug. 24, 1903.

⁴ Med. News, Aug. 6, 1904.

⁵ Therap. Gaz., Dec., 1903.

⁶ Public Health, Dec., 1903.

and found to have a disinfectant value varying from $1\frac{1}{2}$ to 16 times that of pure carbolic acid. Chemic examination showed wide differences in composition, which, however, furnishes no information as to their probable bactericidal value. Some specimens contained appreciable quantities of pyridin bases, which impart a strong and characteristic odor, without contributing to the germicidal properties. He is of the opinion that if the name is to remain in the literature of the subject, a statement of the germicidal value in terms of some standard should be insisted upon in all cases.

Digitalis.—O. Loeb¹ has studied the action of a number of heart-stimulants upon the coronary arteries. The heart was isolated, blood allowed to circulate through the coronary system under uniform pressure and temperature, and the amount of blood escaping from the coronary veins into the auricles carefully measured from minute to minute. The coronary arteries were not much influenced by strophanthin. *Digitoxin* contracted them so strongly that only half the amount of blood was allowed to flow through after a few minutes. Caffein and theobromin increased the frequency and volume of the pulse; the amount of blood discharged by the coronary vein remained the same or was slightly increased. The latter was more marked with theobromin, and may have been due to increased heart-action and not to dilation of the arteries. Ether dilated the vessels and interfered seriously with the heart-beat. Chloroform proved so toxic that accurate observations could not be made, while alcohol, even in high concentration, seemed to have little effect other than an increase of the pulse-volume.

Gottlieb and Magnus² have also experimented with the isolated mammalian heart to determine the effect of digitalis upon its activity. They find that the first effect of this drug is to increase the strength of the contractions and to regulate their rhythm when the cardiac activity has become irregular. Slowing of the pulse occurs only to a slight degree, as this is due to the centric action of the drug. In the second stage of poisoning the pulse becomes irregular and gradually diminishes in strength. The heart dilates less and less in diastole, and in most cases finally stops entirely during systole. The changes wrought by digitalis in the cardiac activity occur independently of pulse-frequency, and are dependent upon the action of the drug upon the motor apparatus of the heart. In the early stages of digitalis poisoning the working power of the single cardiac contraction may be increased to more than 3 times the normal.

K. Brandenburg³ finds that moderate doses of digitalis lessen the response of the cardiac muscle to electric excitation. This effect is entirely independent of any nervous influence, and is produced by doses corresponding to the therapeutic dose in man. The excitability of the heart is slowly diminished, reaching its lowest point in from 12 to 20 hours, and then gradually returns to normal. There is no change in the latent

¹ Arch. f. exp. Path. u. Pharm., 1904, li, No. 1.

² Arch. f. exp. Path. u. Pharm., 1904, li, No. 1.

³ Zeit. f. klin. Med., 1904, Bd. liii, p. 255.

period of stimulation. At the same time the contractility of the heart-muscle is increased. These phenomena are ascribed to an increase in the anabolic changes within the muscle, since it has been shown that, in the cardiac cycle of a normal heart, the period of least excitability corresponds to the period of greatest anabolism.

G. W. Crile¹ finds that animals suffering from shock do not live longer, and perhaps not so long, when treated with digitalis as they do when the drug is omitted. Injections usually caused a slight rise in the blood-pressure, but under attempts to push the drug, the heart became extremely irregular or the animal died suddenly from cardiac failure. The respiration, when at all affected, was either impaired or arrested. F. B. Wynn,² from experiments conducted on Belgian hares extending over a period of 4 months, has found that the prolonged administration of digitalis (about 65 minims of the tincture daily) produces a slight degree of cardiac hypertrophy. He thinks it doubtful, however, that the remedy is responsible for hypertrophy to any extent in valvular heart-disease. A. Fraenkel³ has investigated the action of digitalin, digitoxin, and strophanthus on the heart in animals, with the following results: All these drugs are very slow in producing their effects on the circulation; if but one therapeutic dose of digitoxin is given, the slowing of the pulse does not appear for 60 hours; with digitalin it appears in 24 hours; and with strophanthin, in 4 or 5 hours. Fatal doses act somewhat more quickly. The first symptom of poisoning is vomiting; this occurs before the circulatory changes are noted. Very small doses of any of these drugs may be toxic in time, and to keep within safe limits doses should be given which, even when several are counted together, will not produce physiologic results. Such doses can be given for a long time without causing cumulative action, but should the interval be shortened or the dose increased, vomiting quickly occurs. Digitoxin is the most dangerous. The effects of these drugs pass off slowly; after a single dose of any of them the pulse remains subnormal for over a week. The cause of the cumulative action is probably not slowness of elimination, since strophanthin, which has the same cumulative action as the others, being readily soluble, would be voided quickly. Cumulative action must be due to the firmness with which they unite themselves to the heart-muscle. The practical deductions drawn from these observations are that it is much easier to obtain therapeutic results by the repeated administration of small doses than by the use of 1 or 2 single large doses. When these drugs are being used continuously, the occurrence of even physiologic alterations in the pulse should be the sign for suspending them for a day or two. Digitoxin is not to be recommended for any therapeutic purpose. If prompt action is required, strophanthin is certainly the most desirable of these agents. Although strophanthin has the least tendency to cumulative action, the frequent use of it may, nevertheless, give rise to this condition. F. Zuccala⁴ is convinced, from the success he experienced in

¹ Amer. Med., Apr. 23, 1904.

² Jour. Am. Med. Assoc., July 16, 1904.

³ Arch. f. exp. Path. u. Pharm., 1904, li, No. 1.

⁴ Gaz. degli Osped., 1903, xxiv, No. 146.

14 cases of pneumonia from the administration of large doses of digitalis (60 to 75 grains in infusion a day), that the drug has a specific influence. Venesection is regarded as a valuable adjuvant. A. Amucano¹ also claims that digitalis in large doses has a specific action in pneumonia.

Dionin.—J. Hinshelwood² bears testimony to the efficacy of dionin (5 % solution) in painful affections of the eye. Its analgesic action is comparable to that of holocain, but superior to it, and very far in advance of that of cocain. It is, however, not an anesthetic, and is, therefore, not suited for use in operations on the eye. Patients should be warned that the first instillation sometimes causes chemosis of the conjunctiva, which swells up and overlaps the cornea. This soon subsides and is of no serious import. A. Rahn³ points out that dionin greatly increases the sedative and narcotic properties of morphin. The dose of the latter can be very materially decreased if one or two doses of dionin are given beforehand.

Ethyl Chlorid.—F. Pfister,⁴ E. E. Montgomery and P. B. Bland,⁵ S. H. Large,⁶ St. John Dansey,⁷ and A. B. Craig⁸ present papers recommending ethyl chlorid as a general anesthetic for brief surgical procedures. They all agree that it is contraindicated in major operations requiring total muscle relaxation. Pfister thinks it is safer by far than chloroform or ether. Erdmann and Craig believe that, so far as safety is concerned, it is surpassed only by nitrous oxid. Dansey prefers it to nitrous oxid because it gives a longer narcosis, is less unpleasant to the patient, induces narcosis more quickly, and is cheaper. Large sums up its advantages in: its safety and reliability; simplicity of administration; lack of cyanosis, struggling, or other unpleasantness; lack of after-effects; its cheapness and easy mode of administration. A disadvantage, according to Montgomery and Bland, is that the patient passes under and out of its influence so quickly that the administrator must be unusually expert to avoid, on the one hand, profound anesthesia, and, on the other, the emergence from its effects at an important stage of the operative procedure. Stephenson and Chaldecott⁹ highly recommend ethyl chlorid as being a specially useful anesthetic in eye-work. C. T. Hansen¹⁰ has followed up a large number of cases of lupus in which the treatment had been refrigeration with ethyl chlorid. He finds that while in a few cases there was a permanent cure, in 11 % the treatment was ineffectual, and in 78 % the results were actually unfavorable. The injurious action was the more marked the less extensive the lesions and the shorter the duration of the disease. Hansen warns, therefore, that this treatment must be used with caution, as it is likely to do ultimately more harm than good.

Eucalyptus.—C. Hall¹¹ finds that each species of eucalyptus growing in Australia contains a volatile oil differing in composition from the oils of all other species, and, further, that eucalyptol is not the equivalent of the oil. Eucalyptol is one of the proximate principles of the oil, but not

¹ Gaz. degli Osped., 1904, xxv, No. 49.

² Therap. Monatsh., May, 1904.

³ Jour. Am. Med. Assoc., Apr. 2, 1904.

⁴ Australasian Med. Gaz., June 20, 1904.

⁵ The Ophthalmoscope, Apr., 1904.

⁶ Brit. Med. Jour., Apr. 30, 1904.

⁷ Wisconsin Med. Jour., Jan., 1904.

⁸ Cleveland Med. Jour., June, 1904.

⁹ Amer. Med., Oct. 1, 1904.

¹⁰ Hospitals tidende, 1903, xlv, No. 33.

¹¹ N. Y. Med. Jour., June 25, 1904.

the most important of them as a bactericide. Of all the constituents of the oil, aromadendral is the most powerful bactericide. [In the light of this paper our literature in regard to this important substance should be re-written.]

Euphthalmin.—C. A. Oliver¹ states that this is the best agent for dilating the pupils for ophthalmoscopic purposes. Two drops of a 5 % solution produces maximum mydriasis, lasting 2 to 3 hours, the pupil returning to normal within 20 hours. A. B. Hale² also believes that euphthalmin is the best pure mydriatic for diagnostic purposes.

Euquinin.—This is an ethyl-carbonic ester of quinin. Though less active than the ordinary salts, it has some advantage in being tasteless. A. Mori³ has used it in the prophylaxis of malaria in 74 persons, the dose being 4 to 8 grains morning and evening. Only 6 showed evidences of malaria, and 2 of this number had abandoned the drug for a week before the first sign of the disease. W. Stekel⁴ and Kraus⁵ speak favorably of euquinin (5 to 15 grains a day) in the treatment of whooping-cough.

Exodin.—This is a synthetic compound derived from oxyanthraquinon, and, therefore, related to emodin and purgatin. It is a yellow, odorless, tasteless powder, insoluble in water, but slightly soluble in alcohol. It is recommended as a mild purgative. According to W. Ebstein,⁶ exodin stands midway between the laxatives and the purgatives, a dose of 15 grains usually producing one or more mushy stools within 12 hours, without interfering with the appetite, deranging the stomach, or causing colic. Many of Ebstein's patients preferred it, on account of its tastelessness and prompt, effective, and painless action, to all other cathartics. It is best taken in the form of tablets ($7\frac{1}{2}$ grains), which should be disintegrated in water, the mixture being drunk under stirring. A. Stanwater⁷ confirms Ebstein's favorable impression of exodin. [We have found this substance to fulfil well the claims made for it.]

Formaldehyd.—Since 1899 G. De Simon⁸ has used formaldehyd locally (1 % to 2 % solutions of the commercial formalin to the pharynx) in the treatment of whooping-cough, and reports its action as very favorable. Vomiting followed the applications in a few instances, but in no case were toxic effects observed. Sembritzki⁹ also states that formalin is most effective in whooping-cough. Two or three pastils are very slowly vaporized in a formalin lamp placed in the sick-room or in an adjoining apartment.

L. Levison¹⁰ reports a fatal case of formalin poisoning in a man aged 60 who swallowed, probably with suicidal intent, about 2 or 3 ounces of the commercial (40 %) preparation. The symptoms were intense pain, profuse lacrimation, rapid, noisy respiration with abundant moist rales, cyanosis, and a rapid pulse. Unconsciousness soon supervened, the pulse became imperceptible, and death resulted within half an hour after the poison had been taken. The diagnosis was made by the odor of the drug

¹ Ann. of Ophthal., 1903, vol. xii.

² Gaz. degli Osped., 1904, xxv, No. 7.

³ Allg. Wien. med. Zeit., 1904, No. 5.

⁴ Therap. d. Gegenw., June, 1904.

⁵ Therap. Monatsh. Nov., 1903.

⁶ Medicine, July, 1903.

⁷ Klin-therap. Woch., 1903, x, No. 23.

⁸ Deut. med. Woch., 1904, xxx, No. 1.

⁹ Il Policlinico, Oct. 10, 1903.

¹⁰ Jour. Am. Med. Assoc., June 4, 1904.

on the breath. Treatment consisted in administering, hypodermatically, first apomorphin and then stimulants. An effort to pass a stomach-tube proved unsuccessful. [It may not be generally known that the chemic antidote for formalin poisoning is ammonia, which forms with formaldehyd the comparatively innocuous urotropin.] G. Riggio's¹ conclusions from experimental researches are to the effect that formalin is a poison which induces intense hyperemia in the organs by which it is probably eliminated. This occurs when the poison is administered subcutaneously or by inhalation. The hyperemia is so intense that it induces hemorrhages in the liver, kidneys, and lungs. The formalin has also a destructive action on the cells of these organs.

E. Gianelli² concludes, from his investigations, that formaldehyd is not eliminated as such from the organism, but probably undergoes oxidation in the tissues. According to Gianelli, Polacci's reagent gives the same reaction with mucin as it does with formaldehyd, and this was the source of error in previous investigations.

Gelatin.—H. C. Wood, Jr.,³ reviews the uses of gelatin as a hemostatic. He points out its value in hemoptysis, purpura, hemophilia, epistaxis, and metrorrhagia. The difficulty of perfectly sterilizing it has been overcome by the placing, by various manufacturers, upon the market of a 10 % solution, which is guaranteed to be absolutely sterile. It is equally efficacious when given by the mouth and when applied locally on tampons. L. Moll⁴ concludes, from an extensive series of experiments, that gelatin locally applied aids in checking hemorrhage by agglutinating the corpuscles, and that when given internally, it acts as a hemostatic by augmenting the production of fibrinogen. Gley and Richaud⁵ conclude, from their researches, that gelatin contains certain substances which actually retard coagulation, and when it succeeds as a hemostatic, it is due to the fact that it contains the exact proportion of calcium salts needed by the individual. They denounce gelatin, on the whole, as unfitted for general hemostasis.

Lancereaux,⁶ the originator of the gelatin treatment of aneurysms, relates the history of 8 cases of large aneurysms of the aorta treated in this way; 4 of the patients are in good health to-day. In thousands of injections he has never seen a mishap. He concludes that no other method of treatment can show such good results in 50 % of the cases.

Hay-fever Antitoxin.—Dunbar's antitoxin, produced by injecting the pollen of rye and other grasses into various animals (See YEAR-BOOK for 1903), has been tried somewhat extensively in the past year. A. Lubbert and C. Prausnitz⁷ report the results obtained from the employment of the serum in 222 cases of hay-fever and 63 cases of autumnal catarrh. Of the former, 57 % were cured, 32 % improved, and 11 % not influenced. Of the latter (autumnal catarrh), 70 % were cured, 19 % improved, 11 % not influenced. For application to the nasal mucous

¹ *Riforma Medica*, 1904, xx, No. 25.

² *Riforma Medica*, Nov. 18, 1903.

³ *Therap. Rev.*, Apr., 1904.

⁴ *Wien. klin. Woch.*, xvi, No. 44.

⁵ *La Presse méd.*, 1904, i, No. 32.

⁶ *Bull. de l'Acad. de Méd.*, 1904, lxxviii, No. 27.

⁷ *Berl. klin. Woch.*, 1904, xli, Nos. 11, 12.

membrane the antitoxin is best used in the form of a snuff, but for application to the eyes the serum is better. R. Mohr,¹ A. MacCoy,² and P. McBride³ also report favorably upon the action of Dunbar's serum. L. S. Somers⁴ concludes, from his experience with the use of a serum obtained by inoculating animals with pollen toxin of golden-rod in 10 cases, that the remedy produces prompt and positive amelioration of the symptoms of fall hay-fever in the majority of cases.

Hedonal.—This substance, which is chemically methylpropylcarbinolurethane, in a white, crystalline powder, of a menthol-like taste, almost insoluble in water, but soluble in ether and alcohol. J. Fraczkievich⁵ concludes, from his experience with the drug as a hypnotic, that it is useful in the insomnia of hysteria, neurasthenia, senility, and psychoses of milder grades, but that in insomnia from pain it is without effect. It produces, within from $\frac{1}{4}$ to 1 hour, a moderately deep, dreamless sleep, lasting 5 to 8 hours, not followed by unpleasant after-effects. Even when it was used for a considerable period no harm resulted. The dose was 20 to 30 grains. V. Coblenz⁶ states that there can be no doubt that hedonal is a distinct improvement over urethane, but it cannot compare in power with many other hypnotics (chloral, sulphonal, trional). In mild forms of insomnia, however, it has proved an agreeable, useful, and safe hypnotic. A. Strass⁷ found, in a series of cases, that hedonal had little effect on insomnia, unless it were combined with some other drug influencing the cause of the sleeplessness more directly, as with strophanthus in heart-disease, codein in phthisis, and bromids in neurasthenia. In neuritis and chronic alcoholism it tended to produce cerebral congestion and some excitement, and was soon refused by the patients. [We agree with Coblenz that this is an excellent but mild hypnotic.]

Helmitol.—This is a combination of methylcitric acid and urotropin (hexamethylenetetramin), 1 gram of helmitol containing 0.4 gram of urotropin. It is more soluble in water than urotropin, and also cheaper. Unlike urotropin, it parts with formaldehyd freely in the presence of alkalis. G. Keleman⁸ has used it with good results in various forms of cystitis, sometimes succeeding after failure with urotropin. The dose was from 3 to 9 grains daily. Geyer⁹ reports a case of pyonephrosis which yielded to helmitol in doses of from 45 to 60 grains daily. [Unfortunately, so much larger doses than of urotropin are required that it is not likely to supplant the latter.]

Hyoscin.—G. Petty¹⁰ and J. Buchanan¹¹ indorse the treatment of morphinism originated by Lott,¹² which consists in keeping the patient thoroughly under the influence of hyoscin for 2 days or more.

A. Rose¹³ reports a case illustrating the great efficacy of hyoscin ($\frac{1}{150}$

¹ Deut. med. Woch., 1904, xxx, No. 4.

² N. Y. Med. Jour., Nov. 21, 1904.

³ Edinburgh Med. Jour., July, 1903. ⁴ Proc. Phila. Co. Med. Soc., Dec. 31, 1903.

⁵ Therap. Monatsh., 1903, No. 11.

⁶ Merck's Archives, June, 1904.

⁷ Wien. klin. Rundschau, 1903, No. 50.

⁸ Die Heilkunde, May, 1904.

⁹ Therap. Monatsh., 1904, xviii.

¹⁰ Therap. Gaz., Oct. 15, 1903.

¹¹ Am. Jour. of Insanity, Apr., 1904.

¹² See YEAR-BOOK for 1904.

¹³ Brit. Med. Jour., Dec. 23, 1903.

to $\frac{1}{100}$ grain twice daily) in controlling the tremors and neuralgic pains of paralysis agitans. Picardt¹ has found hyoscin preferable to atropin in cases of gastric hypersecretion. He claims that it is less likely than atropin to cause unpleasant secondary symptoms. J. Given² reports a case of poisoning from the administration, by mistake, of about $\frac{1}{14}$ of a grain of hyoscin. Stimulants were employed and the patient gradually recovered. F. Krauss³ reports an instance of poisoning in a girl of 15 from the instillation, in each eye, of $\frac{1}{120}$ grain of hyoscin hydrobromid. Recovery was complete without treatment within 8 hours.

Ichthargan.—This is a combination of ichthyol and silver (30 %), appearing as a brown powder, readily soluble in water, glycerin, and dilute alcohol. G. Woyer⁴ has found it very serviceable in gonorrheal urethritis and gonorrheal cystitis, especially in the latter. He irrigates the urethra with solutions of from 1:5000 to 1:1000, and the bladder with solutions of from 1:10,000 to 1:8000. K. Neuwirth⁵ and A. Kronfeld⁶ also speak highly of the action of ichthargan in gonorrhea and vaginitis. J. Burnet⁷ believes it to be the remedy *par excellence* in atrophic rhinitis, and E. Guttman⁸ has obtained excellent results in ophthalmologic cases, especially in secreting trachoma and pannus, from daily instillations of a 1 % solution.

Ichthyol.—J. Stubbert⁹ calls attention to the value of large doses of ichthyol in pulmonary tuberculosis. He administers the drug in one of two ways: in enteric, coated pills containing 2 or 5 grains each, or in the form of a glycerol, composed of equal parts of crude ichthyol and glycerin, of which mixture 1 dram may be taken 3 times a day after meals. Vomiting or diarrhea sometimes occurs, but it quickly subsides on withdrawal of the drug, and does not return when the treatment is resumed. M. Rosenberg¹⁰ and Spangler¹¹ also speak in high terms of the use of ichthyol in phthisis. M. Hodara¹² reports 3 cases of mycosis fungoides in which cure followed the prolonged administration (for several years in one case) of from 8 to 22 grains of ichthyol daily. [The difficulty of inducing patients to take this disagreeable remedy in sufficiently large dose and for long periods militates against its efficiency in chronic disease.]

Iodids.—F. J. Smith¹³ has found nothing so efficacious in phthisis with useful cough—that is, one that clears out the lungs—as a combination of potassium iodid (8 grains) with syrup of tolu ($\frac{1}{2}$ dram) in water ($\frac{1}{2}$ ounce), 3 times a day.

W. Kingdon¹⁴ reports 3 cases of thoracic aneurysm in young men in which very marked improvement followed the administration, for some time, of potassium iodid in daily doses of about 75 grains. In each case the urgent symptoms subsided and the patient was able, after 3 or 4

¹ Therap. d. Gegenw., 1903, v, 286.

² Lancet, Jan. 2, 1904.

³ N. Y. Med. Jour., Dec. 12, 1903.

⁴ Klin-therap. Woch., 1903, No. 18.

⁵ Therap. Monatsh., June, 1903.

⁶ Therap. Monatsh., Jan., 1904.

⁷ Lancet, Mar. 12, 1904.

⁸ Woch. f. Ther. u. Hyg. des Aug., 1903, v, No. 36.

⁹ Med. News, Apr. 9, 1904.

¹⁰ Med. Rec., Nov. 21, 1903.

¹¹ Proc. Phila. Co. Med. Soc., 1903, vol. xxii.

¹² Monat. f. prak. Derm., 1903, xxxviii, No. 10.

¹³ Brit. Med. Jour., May 28, 1904.

¹⁴ Lancet, Aug. 22, 1903.

months, to get up and return to work. He holds to the view that failure of the Tufnell treatment is often due to the administration of the drug in too small a dose, especially when symptoms of iodism appear. C. Mammack,¹ on the other hand, is of the opinion that nothing is gained in the treatment of aneurysm by giving more than 60 grains of the iodid a day. F. Lesser² attributes iodism to the sudden pouring-out of iodized alkalis through the mucous membranes. He suggests in prophylaxis that the iodine salts should be administered in mucilaginous vehicles in small doses, at frequent intervals, so as to render absorption slower and more gradual. When there is marked idiosyncrasy, he thinks it advisable to give iodized fats or injections of iodipin, or to administer the iodid by the rectum, as absorption occurs slowly from the bowel. H. Gathmann³ reports a case in which a single dose of 15 grains of potassium iodid caused diffuse ecchymosis of the fingers, the affected parts being cold, stiff, and very painful.

Iodin.—Labbé and Lortot-Jacob⁴ find, by experiments on animals, that iodine causes great activity in the cells of the spleen and glands, and conclude that the drug is, therefore, of value in infection of these organs. N. Palombari⁵ reports 3 cases of tuberculous peritonitis treated successfully by subcutaneous injections, in the region of the abdomen (1 gram daily), of Durante's solution of iodine. This solution consists of iodine, 1 part; potassium iodid, 10 parts; guaiacol, 20 parts; sterile glycerin, 80 parts. Dubar⁶ reports 2 cases of goiter in young girls in which marked reduction in the size of the gland followed weekly injections of 15 drops of a 40 % mixture of iodine in oil. V. Wyatt Wingrave⁷ recommends the following combination as a nontoxic preparation of iodine: Iodine, 2½ grams; tannic acid, 4 grams; alcohol (90 %), 38 cc.; syrup, q. s. ad 75 cc. The iodine is dissolved in the alcohol, the tannic acid and 30 cc. of syrup are added, and the solution is heated to just below boiling-point until it affords no evidence of free iodine with a starch reaction (about 20 minutes); it is then cooled, and the remainder of the syrup is added with flavoring. Each dram contains 2 grains of iodine. Wingrave has found it especially useful in chronic lymphadenitis. The dose is ½ to 2 drams, in water or wine, before meals.

Iodipin.—H. Winternitz,⁸ the introducer of iodipin (an addition-product of sesame oil with iodine), concludes that iodipin is indicated when prolonged effect is desired, especially as loss of weight and cachexia do not develop; and in asthma, syphilitic endarteritis, and lead colic considerably more can be accomplished with iodipin than with the ordinary iodids. R. Fuchs⁹ reaches similar conclusions. The subcutaneous method of administration is regarded as the best, 20 cc. of the 25 % solution being given at each injection. The 10 % solution may be given internally in doses of from 3 to 4 teaspoonfuls. J. Moore¹⁰ and E. Thumen¹¹ report favorably upon the action of iodipin in syphilis.

¹ Med. Rec., Apr. 2, 1904.

² Med. Rec., Jan. 30, 1904.

³ Gaz. degli Osped., Sept. 27, 1903.

⁴ Lancet, Apr. 9, 1904.

⁵ Heilmittel Rev., Jan., 1904.

⁶ Allg. med. Zeit., 1903, No. 34.

⁷ Deut. med. Woch., 1903, xxix, No. 46.

⁸ La Presse méd., Nov. 28, 1903.

⁹ Le Progrès méd., 1904, No. 4.

¹⁰ Münch. med. Woch., 1, No. 29.

¹¹ Northwestern Lancet, Nov. 1, 1903.

Iodoform.—Heile¹ finds that iodoform owes its antiseptic properties not to nascent iodine, but to a very much more active substance, diiodoacetylidin, which is set free by the breaking-up of the iodoform molecule in the tissues. This occurs only when external air is excluded, and is most active when the iodoform is in contact with organic substances.

Iron.—R. W. Wilcox² discusses the pharmacology of iron, and remarks that the term "organic" should be discarded and the term "masked" substituted. The hemoglobin cannot be considered, as it is destroyed at once in the stomach, and therefore blood-products for administration are useless. Many so-called organic iron compounds are practically only combinations of iron salts with albuminoids. This is shown by their reaction to silver nitrate. In true masked iron the addition of hematoxylin solution causes no color-reaction in determining the form of masked or organic iron for oral administration. Wilcox says that one should be selected that is of definite chemie composition; does not precipitate with silver nitrate; does not give a blue-black color with MacCallum's test; which is not decomposed by the acid of the gastric juice, and yields definite results in an increase both of red cells and of hemoglobin. W. Murrell,³ as the result of clinical tests, concludes that Bland's pill is inferior to dried iron sulfate, and that a good organic preparation compares favorably with the sulfate or other inorganic salts, apart from the great advantage of being easily assimilated and free from the discomforts which so frequently attend the administration of the astringent forms of the drug. Iron-vitellin is regarded by Murrell as the best organic preparation.

Lactagol.—This is the powdered extract of the seed of the cotton plant. It has been long used as food for milch cows. In doses of from $2\frac{1}{4}$ to 3 drams daily J. Brink⁴ has found it very useful in increasing the milk secretion in nursing women. R. Mond⁵ and T. Zlocisti⁶ confirm Brink's results.

Lysoform.—This is a soft soap containing about 8 % of formaldehyde with a small amount of volatile oil. Galli-Valerio's⁷ experiments confirm the findings of Symanski and Seydewitz that lysoform is slower in action than many better known agents. A 3 % solution was ineffective against the *Bacillus coli* in less than 45 minutes. Stronger solutions than 3 % caused too much irritation for local use in abdominal surgery.

Mercury Binioid.—H. A. Hare⁸ finds that this salt, in doses of $\frac{1}{200}$ grain in watery solution every 8 hours, is of great value in aborting acute tonsillitis.

Mercury Chlorid.—Tonkin and Neish,⁹ in dealing with the question of leprosy in Jamaica, states that one of the most successful measures in treatment is the subcutaneous injection ($\frac{1}{4}$ grain each of mercuric chlorid and sodium chlorid in 20 minims of distilled water, twice weekly, into muscles of back or buttocks) of mercuric chlorid, which was employed in

¹ Arch. f. klin. Chir., 1903, vol. lxxi, p. 787.

² Amer. Med., Mar, 12, 1904.

³ Med. Press and Circ., July 6, 1904.

⁴ Deut. med. Woch., 1904, xxx.

⁵ Deut. med. Woch., 1904, xxx, No. 9.

⁶ Berl. klin. Woch., 1904, xli, No. 5.

⁷ Therap. Monatsh., 1903, xvii.

⁸ Jour. Am. Med. Assoc., Mar. 26, 1904.

⁹ Bristol Med.-Chir. Jour., Mar., 1904.

100 selected cases. The injections were painful and followed by induration, sometimes for a week.

Mercury Cyanid.—C. Harrington¹ concludes, from a series of experiments, that the action of this drug as a bactericide in the strength recommended is *nil*, and that it cannot destroy all species of pus-organisms within 3 hours, and in double that strength accomplishes nothing within 30 minutes. It can, therefore, hardly be classed among the effective germicides.

Mesotan.—A. Frankenger² has had good results from applications of mesotan (metoxylmethyl ester of salicylic acid) in all forms of rheumatism, provided the drug was not merely applied, but actually rubbed into the skin. Salicylism did not occur, though salicylic acid appeared in the urine in half an hour. The chief disadvantage was the high price. K. Liepelt³ also speaks favorably of mesotan as an antirheumatic remedy. L. Weil⁴ states that complications (dermatitis, etc.) can be avoided in using mesotan if the following precautions are observed: Never use mesotan pure, but mixed with equal parts of olive oil; paint it on the part, but never rub it in vigorously; withdraw the application on the first appearance of dermatitis; do not cover the mesotan with an impermeable dressing; leave the part uncovered or at most wrapped in flannel; dispense it in perfectly dry vessels, as moistening splits it up into irritating compounds. H. Kayser⁵ also cautions against rubbing the mesotan into the tissues. He noticed general urticaria in almost every case in which it had to be used more than a week. In 3 cases a slight use caused bullous dermatitis. [Though mesotan is more costly and irritating than oil of gaultheria or methyl salicylate, it does not appear to be any more effective as a local remedy.]

Morphin.—E. Reichert⁶ concludes, from experiments, that morphin coincidentally possesses thermodepressor and thermoaugmentor actions, the former being by far the more important. The depressor action is exerted on the caudate thermoaugmentor center and augmentor action on the pontobulbar thermoaugmentor center, and to a limited extent on the muscles; that morphin and cocain are direct antagonists in their actions on the caudate center. K. Grassmann⁷ calls attention to the efficacy of morphin in various cardiac conditions. He finds it an excellent adjuvant to digitalis. He believes that it should be used unconditionally in cardiac asthma, but that in chronic dyspnea of ambulant cases and in acute processes of the endocardium and myocardium it should be used with caution. J. MacDougall⁸ reports several cases illustrating the beneficent effects of morphin as a powerful sedative in severe brain injury.

Nitroglycerin.—G. W. Crile,⁹ from experiments with this drug and amyl nitrite in shock, concludes that they hasten the decline of the blood-pressure and increase the shock.

¹ Boston M. and S. Jour., Jan. 14, 1904.

³ Berl. klin. Woch., Apr. 20, 1903.

⁵ Therap. Rev., Apr., 1904.

⁷ Münch. med. Woch., 1904, li, No. 28.

² Münch. med. Woch., July 28, 1903.

⁴ Münch. med. Woch., 1904, No. 7.

⁶ Univ. of Pa. Med. Bull., Nov., 1903.

⁸ Lancet, June 25, 1904.

⁹ Med. News, May 7, 1904.

Nucleinic Acid.—Mikulicz¹ has found that subcutaneous injections (50 cc. of a 2 % solution) of nucleinic acid given 12 hours before operations on the digestive tract render the postoperative course more favorable by stimulating local leukocytosis. No peritonitis occurred in 34 cases, including 7 cases of resection of the stomach and 15 of gastroenterostomy or enteroanastomosis, in which he thus artificially augmented the resistance of the peritoneum.

Olive Oil.—P. Cohnheim² again calls attention to the value of olive oil in certain forms of pyloric stenosis, especially that form due to spasm the result of small ulcers. He has also used it successfully in stenosis from contracted ulcer or perigastric adhesions, and even in early cases of malignant stenosis. He claims that the oil relieves cramps, lubricates the injured surfaces, reduces hyperacidity, and acts as a food. He gives one dose of from 50 to 100 cc. of warm oil in the morning before breakfast, and directs the patient to lie on the right side for 15 minutes and to abstain from food for 1 hour. H. H. Rutherford³ reports success from the administration of pure olive oil in chronic tropical dysentery. The oil was given before meals in large doses over long periods; beginning with 30 cc. 3 times a day, the amount was gradually increased to 90 cc. 3 times a day. At first it was necessary to mix the oil with milk, but later this was found to be unnecessary, as toleration was soon established. Of 28 cases, 15 were entirely cured and the remainder were either discharged improved or passed from notice. The good effects of the oil are attributed to its cholagog action.

Osmic Acid.—J. B. Murphy⁴ reports a series of cases of trifacial neuralgia in which he obtained excellent results from injections into all the branches—palatine, lingual, mandibular, superior maxillary, and supraorbital—of the affected nerve of a 1.5 % to 2 % solution of osmic acid. Murphy states that the injections can be done under general or local anesthesia; that all the nerves except the supraorbital can be reached through mouth incisions; and that the operation is free from danger. J. R. Eastman⁵ also reports a case of tic douloureux of 20 years' duration in a woman aged 71, in which osmic acid injections gave prompt relief. C. K. Mills, in discussing Murphy's paper, stated that he did not favor the osmic acid injections, although he had not tried them, because he believed that no peripheral treatment could be successful. R. Weir said that the osmic acid treatment had failed in his hands many years ago, and that he could not see how it was any better than resection of a certain portion of the nerve.

Physostigmin.—G. Arndt⁶ describes 5 cases demonstrating the value of eserine in postoperative intestinal paralysis. He usually injects $\frac{1}{64}$ grain of the salicylate, and never more than $\frac{1}{32}$ grain, in the 24 hours. When it does not act promptly, he supplements it by repeated lavage. G. Curlo⁷ has found physostigmin salicylate ($\frac{1}{32}$ to $\frac{1}{20}$ grain in pills) very ef-

¹ Jour. Am. Med. Assoc., May 7, 1904.

² Zeit. f. klin. Med., 1904, lii, Nos. 1, 2.

³ Amer. Med., Mar. 12, 1904.

⁴ Jour. Am. Med. Assoc., Oct. 8, 1904.

⁵ Jour. Am. Med. Assoc., Sept. 24, 1904.

⁶ Zent. f. Gynäk., 1904, xxviii, No. 9.

⁷ Riforma Medica, 1903, xix, No. 36.

fective in coprostasis from intestinal atony and in excessive meteorism. He states that it is contraindicated in spastic conditions, in intestinal catarrh, and in mucomembranous colitis. The signs of intolerance are miosis and sialorrhea. K. Vogel¹ has also had a favorable experience with physostigmin in postoperative ileus. On the other hand, Pankow² has not been favorably impressed with the action of the drug in intestinal paralysis.

Podophyllum.—Neumann³ finds that the drug is far more effective in dislodging the uncinaria from the bowel after the administration of male-fern than calomel, and that even alone it will often dislodge and expel these parasites.

Potassium Permanganate.—E. Martzinovski⁴ has had favorable results in erysipelas from the application of compresses soaked in a solution (1:1000) of potassium permanganate. L. Weiss⁵ has had very good results in hyperidrosis of the feet from hot foot-baths containing potassium permanganate. The baths are taken at bedtime for 2 or 3 weeks, the strength of the solution being gradually increased from 1 % to 6 %. The addition of alum (1 dram) is said to increase their efficacy. In the morning the following dusting-powder is used freely: Potassium permanganate, 13 grams; alum, 1 gram; talc, 50 grams; zinc oxid and calamin, of each, 18 grams.

Quinic Acid.—J. Weiss⁶ holds that this drug alone, or preferably in combination with lithium (urosin), is as efficient in gout as quinin is in malaria or salicylic acid is in acute rheumatism. From 45 to 75 grains should be taken daily in divided doses, dissolved in water, after meals.

Quinin.—Bradley⁷ has obtained good results in Ménière's disease from the administration of quinin in ascending doses, as first recommended by Charcot. In one case the paroxysms fell off from about 2 a day to 1 in 3 months under the use of quinin (18 grains a day).

H. Fulton⁸ speaks very highly of local applications of quinin in hay-fever. He uses a saturated solution of the drug in sterile water as a nasal spray 2 or 3 times daily, and applies to the nasal chambers, every 4 to 6 hours, an ointment containing 30 grains of quinin to an ounce of simple vaselin, this being preferable to white vaselin or albolene.

Radium.—Truman Abbe,⁹ J. Inglis,¹⁰ H. G. Piffard,¹¹ W. Rollins,¹² W. A. Pusey,¹³ and D. Turner¹⁴ contribute articles on the properties of radium. Metallic radium has not been isolated, the products on the market being impure salts of the metal. The activity of a specimen is estimated by the rapidity with which it discharges a gold-leaf electroscope. The standard unit of time adopted is that required for the discharge of such an electroscope by metallic uranium. If the specimen of radium

¹ Zent. f. Gynäk., 1904, xxviii, No. 21.

² Zent. f. Gynäk., 1904, xxviii, No. 31.

³ Deut. med. Woch., 1904, xxx, No. 5.

⁴ Medizin. Obozryenie, 1903, lix, No. 5.

⁵ Jour. Am. Med. Assoc., Aug. 6, 1904.

⁶ Wien. klin. u. therap. Woch., 1904, No. 18.

⁷ Therap. Rev., Apr., 1907

⁸ Jour. Am. Med. Assoc., July 30, 1904.

⁹ Washington Med. Annals, 1904, vol. ii.

¹⁰ Jour. Am. Med. Assoc., Feb. 6, 1904.

¹¹ Med. Rec., Jur

¹² Boston M. and S. Jour., Nov. 12, 1903.

¹³ Jour. Am. Med. Assoc., July 16, 1904.

¹⁴ Brit. Med. Jo

discharges the instrument in one-thousandth the time required by uranium, the strength is taken as 1000 units. Specimens of high strength are generally used—anywhere from 200,000 to 300,000 units. The activity of pure radium bromid is of 1,500,000 to 1,800,000 units. Radium emits both “radiations” and “emanations.” The former are threefold: *Alpha*, *beta*, and *gamma* rays. *Alpha* rays appear to be electrons carrying a charge of positive electricity slightly deviable by the magnet. They constitute the largest proportion of all the rays, but possess but little penetrative power. Glass offers an insurmountable barrier to their passage. The *beta* rays are electrons carrying a negative charge, and are strongly deviable by the magnet, but in a direction opposite to that of the *alpha* rays. They exist in a smaller proportion than the *alpha* rays, but possess greater penetrative power. They appear to be very similar to the rays projected from the cathode of a Crookes tube when excited by a suitable electric current. The *gamma* rays exist in much smaller proportion than the others, are nondeviable, and possess great penetrative power. They are very similar to the röntgen rays. The so-called radioactivity of radium is due to the combined influence of 3 sets of rays. The “emanation” is a gas continually given off from the radium, and may be collected in a separate receptacle. This emanation is not only in itself radioactive, but possesses the power of exciting radioactivity in other bodies in its immediate neighborhood—that is, it confers on them temporarily the power to emit Becquerel rays similar to those of radium. These emanations will not pass through glass. They supply about two-thirds of the heat given off by radium. The therapeutic uses of radium have been shown to follow the same lines as those of the Finsen and röntgen rays. Unfortunately, the radium rays, like the röntgen rays, are not without harmful effects, severe burns and even ulcers resulting from prolonged exposure. Halkin's¹ studies of the action of radium rays on the tissues of young pigs show that they produce changes (degeneration of cells and inflammatory reaction) almost identical with those observed by Scholtz in the tissue of young pigs acted upon by röntgen rays, the chief difference being the greater depth of the latter. J. Danysz² relates experiences which show that the effect of radium rays is more intense in young than in old animals, and applies this fact to explain the selective action of the rays on neoplasms.

Giesels' observation that radium produces luminous effects on the retina even when the eyes are closed suggested the attempt to employ this properly to stimulate the optic nerve in certain cases of blindness. Javal found, in 2 cases of blindness in which there still remained a slight perception of light, that the patients received a light sensation when radium was held before the eyes. In 2 other cases of blindness, one due to optic atrophy, the other to glaucoma, both patients being absolutely blind, there was no perception of light from exposure to radium. E. S. London³ has obtained the same results. Greef,⁴ from studies of the action of radium on pigs' eyes, concludes that the radium has no direct action on

¹ Arch. f. Dermat. u. Syph., 1903, lxxv.

² La Sem. méd., 1904, xxiv, No. 1.

³ Berl. klin. Woch., 1903, No. 23.

⁴ Deut. med. Woch., 1904, xxx, No. 31.

the retina, but that it induces, as Himsted and Nagel believe, fluorescence in certain tissues of the eye, and that this fluorescence is perceived as a light by the retina. He holds that nothing has been advanced to date which encourages any hope that radium will enable the blind to see.

M. Shukowski,¹ from experiments on animals, concludes that radium first increases the excitability of the psychomotor centers and then decreases it. London has shown that strong preparations of radium, when applied to mice, cause drowsiness, paralysis, coma, and finally death. Dixon and Wigham² partially confirm the findings of Aschkinass and Caspari, Pfeifer and Friedberger, and Henry Crooks upon the inhibitory effect of the radium rays on bacterial growth; on the other hand, F. Van Beuren and H. Zinsser,³ with radium of 300,000 activity and exposures of from 10 to 24 hours, failed to observe any positive evidence of bactericidal action.

Francis H. Williams⁴ reports upon the treatment of 42 patients with radium. Nine of the patients had acne, 2 had eczema, 2 had psoriasis, and 4 had lupus. Of the 33 remaining, 1 had keloid, 5 had rodent ulcer, 23 had epithelioma, 4 had carcinoma of the breast. Improvement was reported in the keloid case; 2 of the 5 cases of rodent ulcer had healed and 3 showed improvement; 11 of the 23 cases of epithelioma had healed and 12 were improving, and of the 4 cases of mammary carcinoma 3 were improving. In psoriasis, lupus, and acne the results were very good; in eczema the success was not so marked.

R. Abbe⁵ has employed radium in 40 cases, chiefly in superficial morbid growths. He has cured lupus and epithelioma, and has caused a large cancerous mass to be reduced to one-fourth its former size. The Becquerel (*beta*) rays given off by radium, according to Abbe, are as much stronger than Finsen light as they are weaker than röntgen rays.

Jumon⁶ reports encouraging results from the use of radium (5000 to 19,000) in lupus. The advantages claimed for the treatment are its simplicity, its freedom from pain, and the comparatively short time needed for its completion. J. MacLeod⁷ reports a case of lupus of 13 years' duration which was much improved by biweekly applications of radium (600,000). W. Scholtz⁸ reports the successful application of the radium rays in several cases of lupus of the palate and gums. He also states that an inoperable cancer near the orbit has completely disappeared under radium rays.

Bouveyron⁹ has been much impressed with the efficacy of a dressing containing 75 grains of uranium nitrate in the treatment of an old and rebellious case of lupus. The nitrate is decidedly less powerful than radium in its radioactivity, but its continuous application in the form of a dressing cured the lesion in less than a month.

O. Lassar¹⁰ has had excellent results from the use of radium in inoperable cancer. He applies it in a flexible lead tube on a mica plate which

¹ Obosrenie Psychiatrie, Nov., 1903.

² Dub. Jour. Med. Sci., Mar. 1, 1904.

³ Amer. Med., Dec. 26, 1903.

⁴ Med. News, Feb. 6, 1904.

⁵ Med. Rec., Aug. 27, 1904.

⁶ Rev. de Thérap., 1903, No. 20.

⁷ Brit. Jour. Derm., Jan., 1904.

⁸ Deut. med. Woch., 1904, xxx, No. 25.

⁹ La Sem. méd., 1904, xxiv, No. 27.

¹⁰ Berl. klin. Woch., 1904, xli, No. 20.

allows it to be placed exactly over the desired spot. In thousands of applications not a single mishap has occurred. R. Morton¹ states that radium has given the best results in rodent ulcer and lupus. He thinks the most convenient apparatus is a small glass tube, 1 or 2 inches long, containing 5 milligrams.

A. Exner² has treated 6 cases of cancerous stricture of the esophagus by introducing a scrap of radium embedded in dammar and fastened to a sound. In 5 cases the stricture became enlarged and the dilation persisted after the treatment was suspended. J. M. Davidson³ has employed radium bromid in rodent ulcer, tuberculosis of the skin, and epithelioma with decided improvement and arrest of the disease. In sealed glass tubes it may be applied readily to any part, even introduced into cavities, and its application is painless. M. A. Cleaves⁴ also speaks favorably of the action of radium (7000) in cancer.

M. A. Darier⁵ claims to have good results from the application of radium in certain nervous affections—hysteric convulsions, pseudoataxia, and recent facial palsy.

J. Rudis-Jicinsky,⁶ as the result of numerous experiments, concludes that the action of radium rays and that of röntgen rays upon living tissues is very similar; that radium irritation may be of benefit in some cases, especially in malignant growths situated in cavities, but that it cannot replace the more active and more penetrative röntgen rays. In one series of experiments it took 80 exposures to radium to produce the same effect as 36 exposures to röntgen rays.

J. B. Hammond⁷ reports a very severe case of rodent ulcer in which the use of radium was followed by a decrease in the pain and a lessening of the discharge, but in which the edges of the ulcer remained unaffected. H. G. Plummer⁸ reports 7 cases of cancer treated by exposure to radium bromid. The effects in all cases were negative—either no change or an increase in the size of the nodules. L. D. Bulkley⁹ and Halkin¹⁰ each report a case of lupus in which radium was used without effect. W. W. Keen¹¹ states that in not a single case of carcinoma of 22 in which he had used radium (17,000 up to 1,800,000) had there been the slightest benefit, except in one feature, and that was as to pain. J. F. Schamberg¹² believes that the field of usefulness of radium is extremely limited. He has seen it really beneficial in but one case. W. A. Pusey¹³ is of the opinion that radium will prove superior in some respects to the röntgen rays, but that it is to a very great degree less efficient than röntgen rays in its general therapeutic usefulness.

Red Light.—N. R. Finsen¹⁴ reinforces his defense of the red-light treatment of smallpox (see YEAR-BOOK, 1904) by reference to 5 communications that have recently appeared, all favorable to this treatment.

¹ Brit. Med. Jour., Apr. 23, 1904.

² Brit. Med. Jour., Jan. 23, 1904.

³ La Sem. méd., 1904, No. 7.

⁴ Brit. Med. Jour., Apr. 23, 1904.

⁵ Jour. of Cutan. Dis., Feb., 1904.

⁶ N. Y. Med. Jour., Sept. 17, 1904.

⁷ Jour. Am. Med. Assoc., July 16, 1904.

⁸ La Sem. méd., 1904, xxiv, No. 9.

⁹ Med. Rec., Oct. 17, 1903.

¹⁰ Iowa Med. Jour., Apr. 1904.

¹¹ Lancet, Apr. 1904.

¹² Arch. f. Derm.

¹³ Amer. Med.,

¹⁴ Hospitals tid.

In addition, he has had reports from 2 small epidemics on the Faroë Islands and in England, in which red light was used with unquestionably good results. Naunyn was especially impressed with its action in 11 cases at Strasburg, although 1 exceptionally severe confluent case terminated fatally. Emmerson, in a private letter to Finsen, expresses himself much more favorably than in his published report.¹ Five of his 11 patients had never been vaccinated. Carassa did not have any suppurative fever in his 6 cases thus treated, including 3 confluent ones.

J. T. C. Nash² has employed the red-light treatment in 30 cases of smallpox. Though none of the cases were regarded as being extremely grave, he believes that the suppurative stage was considerably modified and rendered less severe by the red rays, or rather by the exclusion of the other elements of light. H. Peck³ reports the results of the red-light treatment in 85 cases of smallpox. There were 2 deaths, 1 an unvaccinated child of 7, giving a mortality among the unvaccinated of 8.3 %; the other of a debilitated tramp, giving a mortality among the vaccinated of 1.3 %. Disfigurement was less frequent. Peck believes that the results point to the advisability of a more extended trial of the treatment. T. F. Ricketts and J. B. Byles⁴ have employed the red light in 13 cases (5 vaccinated, 6 unvaccinated; 4 discrete, 9 confluent) of smallpox. Two of the patients died. The authors regard the treatment as being harmful rather than beneficial. A great drawback to the treatment, they find, is that it puts a check on the supply of fresh air. J. Regnault⁵ calls attention to the fact that red applications (red lotions and red curtains) have been extolled by the Chinese for centuries as effectual in smallpox.

W. O. Motschan⁶ reports a case of noma with perforation of the cheek which healed rapidly under exposure to light from an incandescent lamp (16 candle-power) with red glass and fitted with a conic reflector. The lamp was placed 8 inches from the ulcer, and the exposure was continuous day and night.

Kellermann⁷ and L. Schmidt⁸ report excellent results from exposure to blue light in lupus, eczema, acne, and leg ulcers.

E. Kromayer⁹ believes that phototherapy with the iron arc lamp is the most effectual means at our command for treating alopecia areata. E. Clasen¹⁰ has been favorably impressed with the action of the iron lamp in acne and sycosis. He had but one failure in 14 cases of acne. [Kromayer's lamp is an arc light with iron instead of carbon points. A solution of methylene-blue is used to eliminate from the light the irritating ultraviolet rays. This light, unlike the Finsen, does not require compression of the part to be treated.]

Röntgen Rays.—Lepine and Boulud,¹¹ as the result of an elaborate experiment, have shown that the rays cause a distinct increase in the glycolytic power of the blood without inducing any change in the polari-

¹ Med. Times and Hosp. Gaz., July 4, 1903.

² Lancet, Mar. 5, 1904.

³ Public Health. Abstr., 1904.

⁴ Lancet, July 30, 1904.

⁵ Wien. klin. Woch., 1904, No. 22.

⁶ Jour. Am. Med. Assoc., Feb. 27, 1904.

⁷ Therap. d. Gegenw., 1903, No. 7.

⁸ -20, 1903.

metric deviation, although the latter was sensibly increased in another series of experiments. The pancreas of a dog was also used in experiment. The part exposed to the rays for $1\frac{1}{2}$ hours showed a distinct increase in the conversion of starch into sugar. They also found that the interposition of an aluminum plate between the tube and the subject prevented the lassitude and anorexia which the direct action of the rays tends to produce. G. Baermann and P. Linser¹ corroborate the assumption that the bloodvessels are the tissues that especially suffer from the action of the röntgen rays, and point out that the constitutional symptoms are the result of the absorption of the toxic products of destroyed cells. The experiments of H. Heinke² on mice, rabbits, and dogs throw some light upon the favorable action of the röntgen rays in leukemia and Hodgkin's disease (*q. v.*). He finds that a brief exposure (15 minutes) of the abdomen to a hard tube at a short distance induces a distinct destruction of the nuclei of the follicles of the spleen, of the mesenteric glands, and of other lymphatic structures. As the exposure was too brief to affect the skin, it is evident that the lymph-glands are much more sensitive than the former. The lesions, however, were not permanent, and nothing pathologic could be discovered after a week or two. As the rays exert a destructive influence on adenoid tissue, they are indicated, according to Heinke, when there is increased growth on hyperfunction of the lymphatic system, as in leukemia, pseudoleukemia, chronic enlargement of the spleen, lymphosarcoma, and in cases in which there is reason to believe that the thymus is abnormally large. Perthes³ exposes a large number of the fertilized ova of *Ascaris megalocephala* to the röntgen and radium rays. He found that their results were identical in kind, each causing the ovum to develop into an imperfect abnormal embryo. The same effect on cell-segmentation was observed in plant-cells. These phenomena indicate, according to Perthes, that the rays induce the formation of substances in the living cell which in turn injure the chromatin of the nucleus.

Albers-Schönberg⁴ has demonstrated, by experiments on animals, that prolonged exposure (375 to 520 minutes) to röntgen rays causes complete sterility by killing the spermatozoa; whether the sterility is transient or permanent, he has not yet determined.

E. Schiff⁵ reports a case of mammary cancer with an ulcerated surface, enlarged and broken-down axillary glands, and a number of nodules on the back (*cancer en cuirasse*), and regarded as inoperable, in which, after four months' treatment with röntgen rays, the primary tumor was displaced by a flat scar, the cutaneous metastases had disappeared, and the lymph-glands had diminished in size. An examination of a fragment of tissue from one of the nodules on the back showed healthy granulation tissue with many new-formed capillaries, and in the deeper parts a few remaining cancer-nests.

J. G. Chrysopathes⁶ reports the case of a woman, aged 35, with a

¹ Münch. med. Woch., 1904, li, No. 23. ² Münch. med. Woch., 1904, li, No. 18.

³ Deut. med. Woch., 1904, xxx, Nos. 17, 18.

⁴ Münch. med. Woch., 1903, l, No. 43.

⁵ Johns Hopkins Hosp. Bull., July, 1904. ⁶ Münch. med. Woch., 1903, l, No. 50.

tumor in the right hypogastrium, which was found at the laparotomy to be an inoperable round-celled sarcoma. Cachexia was already marked. Five months after clinical healing under röntgen-ray treatment the patient returned for advice in regard to impending obesity, which fact emphasized the completeness of the cure. Krogius¹ reports the complete disappearance of a large sarcoma of the skull, with a number of smaller ones, after 1½ months' treatment with röntgen rays. Four months later there was no recurrence.

P. von Bruns² concludes, from his studies of the röntgen rays in carcinoma, that they are no specific, although they promise more than any other agent thus far tried; and that the great majority of all cancers are not amenable to the treatment. Cases in which the röntgen treatment wastes valuable time should never be trifled with, as an operation may ultimately be too late. In cutaneous epitheliomas a complete cure may be expected, but in other cases success is only partial. In inoperable mammary cancer the rays are indicated for their palliative effect. W. B. Coley³ considers the late results of the röntgen-ray treatment of cancer and sarcoma, and concludes as follows: The use of the röntgen ray should be limited to recurrent and inoperable cases, with the sole exception of small superficial epitheliomas of the face. Even here, he believes, the results of excision will prove to be better and more permanent, save in the proximity of the eyelids and nostrils. It is most misleading to report as cures cases in which malignant tumors have merely disappeared under the treatment, since speedy return is the rule rather than the exception. At the present moment there is no evidence to prove that any permanent cures have been obtained, save possibly in the case of rodent ulcer.

H. E. Schmidt⁴ has had excellent results in the treatment of superficial epitheliomas with röntgen rays, but has never witnessed any special effect on subcutaneous growths. One of his most satisfactory cases was a dry chronic eczema with intolerable pruritus. It healed under the röntgen rays; the pruritus, however, returned, but finally yielded to renewed application of the treatment. O. Lassar⁵ writes that the röntgen-ray treatment is proving more and more effective and reliable for many cases of eczema, particularly on the face and hands. After the preliminary procedures the röntgen rays are able to cure many cases without the tedious salves and pastes.

L. Torök and M. Schein⁶ report 7 cases of acne treated with röntgen rays. The results indicate, they say, that this is the most effective and reliable of any method of treatment known, but that it is not invariably successful, 1 of their 7 cases being aggravated rather than improved by the röntgen rays. M. F. Engman⁷ also believes that the röntgen rays are almost specific in acne. G. E. Pfahler reports excellent results from the use of röntgen rays in 2 cases of nevus, a case of lupus vulgaris of 5 years' duration, a case of morphea, and 1 of acne of 20 years' duration. In regard

¹ Arch. f. klin. Chir., 1903, Bd. lxxi, Heft 4.

² Therap. d. Gegenw., 1904, xiv, 28.

³ Med. News, Feb. 6, 1904.

⁴ Derm. Zeit., 1904, xi, No. 1.

⁵ Derm. Zeit., 1904, xi, No. 2.

⁶ Wien. klin. Rundschau, 1903, xvii, No. 37.

⁷ Interstate Med. Jour.

to the treatment of acne with röntgen rays, Pfahler concludes that it meets the indications more satisfactorily than anything else, and that relapses are infrequent. The average case requires for acne about 3 months' time, and from 20 to 30 treatments. The hair, eyes, and eyebrows must be carefully protected during treatment, and no reaction beyond mild erythema should be produced. F. S. Burns¹ reports his experience in the treatment of 150 cases of skin disease, at the Massachusetts General Hospital, with röntgen rays. Of 55 patients with epithelioma, 27 were discharged cured, 9 progressed favorably but discontinued treatment, and 19 are still being treated. Carcinomas below the skin, including cancer of the breast, uniformly failed to respond to the treatment. In lupus, scrofuloderma, and chronic eczema with thickening of the skin the röntgen rays proved very satisfactory. Eight cases of folliculitis of the beard were treated, with no failures, and no case of psoriasis failed to respond, though many were treated.

J. Müller² reports 3 cases of pruritus, 2 of hyperidrosis, and 2 of chronic eczema of the hands, all cured by röntgen-ray treatment after long resistance to other measures. J. R. Pennington³ reports 11 cases of pruritus and treated with röntgen rays. In 10 there was permanent relief; 1 is improved and still under treatment. K. Ullmann⁴ reports a case of alopecia areata cured by röntgen rays. Brocq⁵ presented a patient to the dermatologic society of Paris, who, for 12 years, had been suffering from mycosis fungoides and in whom there was a marked improvement under treatment with röntgen rays. Brocq believes that there is no method of treatment equal in efficacy to radiotherapy in this disease.

F. H. Jacob⁶ has had good results from the use of the röntgen rays in lupus erythematosus, ringworm, and eczema, as well as in lupus vulgaris and rodent ulcer. In the latter he has found recurrence very frequent, and this he attributes largely to insufficient treatment.

W. S. Newcomet⁷ obtained negative results with röntgen rays in pulmonary tuberculosis, but he thinks that the treatment is of advantage in laryngeal cases. Sinuses in the neck, left after the removal of tuberculous glands, were markedly improved in some cases, but in others the results were negative. F. P. Vale⁸ reports a case of tuberculosis of the cervical glands in which strikingly good results followed röntgen-ray treatment. Pusey and Caldwell⁹ also cite 5 cases of tuberculous adenitis in which marked reduction in the size of the glands occurred under röntgen-ray treatment. J. B. Ransom¹⁰ is impressed with the efficacy of röntgen rays in pulmonary tuberculosis. He claims that they relieve pain, permit sleep, stimulate local circulation, and lessen expectoration. Hemorrhage occurred in 3 instances immediately following the exposure, in cases in which hemorrhages had been of recent origin.

¹ Boston M. and S. Jour., Oct. 29, 1903. ² Münch. med. Woch., 1904, li, No. 23.

³ N. Y. Med. Jour. and Phila. Med. Jour., Feb. 20, 1904.

⁴ Wien. klin. Woch., 1903, xvi, 52.

⁵ Soc. de Derm. et Syph., Feb. 4, 1904.

⁶ Lancet, Feb. 20, 1904.

⁷ Therap. Gaz., May, 1904.

⁸ Med. News, Jan. 30, 1904.

⁹ The Röntgen Rays in Therapeutics and Diagnosis, 1904.

¹⁰ Med. Rec., Feb. 27, 1904.

J. Rudis-Jicinsky¹ has found the röntgen rays in conjunction with other measures very efficient in the treatment of tuberculosis of the joints.

A. C. Geyser² reports 18 cases of granular lids successfully treated by röntgen rays. R. Pardo³ also reports favorably upon radiotherapy in 2 cases of trachoma. E. Moser⁴ reports 2 cases of contracture of the joints, one probably from gout, the other from rheumatism, in which the joints became much more flexible under röntgen rays.

W. J. Morton⁵ reports upon the therapeutic effects of artificial fluorescence produced by administering a fluorescible substance (quinin bisulfate or æsculin) and then employing externally an agent (röntgen rays or radium) capable of exciting fluorescence in that substance. Excellent results are reported by Morton in a case of Hodgkin's disease, 3 cases of carcinoma of the breast, 1 case of rodent ulcer, and a case of extensive papillomatous growth of the abdomen.

A. D. Bevan⁶ concludes that the röntgen-ray treatment is indicated in superficial epitheliomas, as a postoperative treatment in most cases of carcinoma, and in inoperable cases of carcinoma. The chief dangers are the possibility, in all cases, of producing a serious röntgen-ray burn and the loss of valuable time and even of the chance of permanent cure in easily operable carcinomas. He believes that the amount of harm for which the röntgen ray is responsible in delaying and preventing operation in carcinoma far outweighs the good it has so far accomplished. M. Kassabian⁷ states that the cases of malignant disease which are totally and permanently cured form a small class. In the latter he includes epitheliomas, external carcinomas, and some sarcomas. He has cured 16 cases of rodent ulcer without a single recurrence. In sarcoma the results have been less favorable than in carcinoma, though he has obtained an absolute cure in 3 cases of the former. As long as a case is operable he would recommend removal of the growth, and when recurrence is noted, repeated application of the röntgen rays. G. H. Stover,⁸ from a considerable experience in röntgen-ray work, concludes that the röntgen ray is a specific for epithelioma—better than the knife or caustics, as it does not disturb the healthy tissue, and as the final cosmetic effect is infinitely better. He holds that excision is the proper treatment for cancer of the breast and of the internal organs, but that it is well to use the rays before and after the operation. D. C. Dennett⁹ reports 6 cases of eczema, 1 of psoriasis, 1 of rodent ulcer, 3 of epithelioma, and 1 of cancer of the stomach, all of which were cured by röntgen rays except the last, which was in no way benefited. He states also that trachoma yields readily to this treatment. C. Coon¹⁰ reports permanent cures from the röntgen rays in cases of epithelioma and acne, distinct improvement in cases of tuberculosis of the lymph-glands and joints, and relief from pain in cases of deep-seated carcinomas. In 2 cases of sarcoma the results of the treatment were negative.

¹ N. Y. Med. Jour., Aug. 27, 1904.

² Gaz. degli Osped., xxv, No. 43.

³ N. Y. Med. Jour., Feb. 20, 1904.

⁴ Penna. Med. Jour., Jan., 1904.

⁵ Med. Rec., Feb. 13, 1904.

⁶ Med. Rec., Oct. 10, 1903.

⁷ Zent. f. Chir., 1904, xxxi, No. 23.

⁸ Jour. Am. Med. Assoc., Jan. 2, 1904.

⁹ Denver Med. Times, Apr., 1904.

¹⁰ Amer. Med., Feb. 20, 1904.

R. Boggs¹ classifies the cases which are amenable to röntgen-ray therapy under 4 heads: (1) Those cases which respond readily, and, as a rule, do not need surgical interference—lupus, epithelioma, acne, eczema, and tuberculous glands. (2) Those which should be treated for a short time, the mass removed, and then continue the röntgen-ray treatment to prevent recurrence—carcinoma. (3) Those cases of carcinoma which are considered inoperable. (4) Cases of incipient tuberculosis, as an adjunct to other treatment.

J. Macintyre² writes that there can be no longer any doubt as to the value of röntgen rays in lupus and rodent ulcer, but that in malignant disease complete removal of the growth at the earliest stage possible by the surgeon is the only safe recommendation to make.

J. T. Dunn,³ E. J. Brown,⁴ B. L. Bryant and H. H. Crane⁵ (2 cases), M. M. Guilloz and Spillman,⁶ L. C. Grosh and W. J. Stone,⁷ H. Grad,⁸ G. H. Evans⁹ (2 cases), C. H. Weber,¹⁰ W. J. Taylor,¹¹ report cases of leukemia symptomatically cured or greatly improved by the röntgen rays. Ahrens¹² reports a case of leukemia in which the erythrocytes and leukocytes were in the proportion of 1 to 1, and in which, after the fortieth exposure to the röntgen rays, the spleen and blood-findings were normal and the patient apparently in robust health. The treatment being intermitted, he returned 6 weeks later, after being overworked and chilled, with an acute relapse, the spleen reaching its former dimensions in 4 days. At this time the röntgen rays were of no avail and the patient rapidly succumbed.

O. W. Steinwand¹³ reports a case of pseudoleukemia successfully treated with röntgen rays.

[That the röntgen rays can exert a most beneficial effect in leukemia, and, in some cases, even bring about a symptomatic cure, has apparently been established; that they are capable of producing an actual cure must remain doubtful in view of the relapse in Ahrens' case and in one previously reported by Senn.¹⁴] K. Dunham,¹⁵ R. Morton,¹⁶ E. G. Williams,¹⁷ Bécclère,¹⁸ S. Tousey,¹⁹ W. S. Newcomet,²⁰ and J. Sherman Wight²¹ contribute papers dealing with the technic of röntgen-ray treatment.

Saline Purges.—J. B. MacCallum,²² in a second communication on the action of saline purges, states that experiments indicate that these substances must be first absorbed to produce their effect, even when introduced into the intestine. They act partly by stimulating peristalsis and partly by increasing the secretion of fluid into the bowel. Calcium salts inhibit both of these actions. The administration of calcium

¹ Med. News, Aug. 20, 1904.

² Brit. Med. Jour., Apr. 23, 1904.

³ Am. Practitioner and News, July 15, 1904.

⁴ Jour. Am. Med. Assoc., Mar. 26, 1904. ⁵ Med. Rec., Apr. 9, 1904.

⁶ La Sem. méd., 1904, No. 22.

⁷ Jour. Am. Med. Assoc., July 2, 1904.

⁸ Jour. of Advanced Therapeutics, Jan., 1904.

⁹ Amer. Med., Aug. 3, 1904.

¹⁰ Amer. Med., May 21, 1904.

¹¹ Cincinnati Lancet-Clinic, May 14, 1904.

¹² Münch. med. Woch., 1904, I, No. 24.

¹³ Jour. Am. Med. Assoc., Mar. 26, 1904.

¹⁴ Med. Rec., Aug. 22, 1903.

¹⁵ Johns Hopkins Hosp. Bull., Feb., 1904.

¹⁶ Brit. Med. Jour., Apr. 23, 1904.

¹⁷ Med. News, Mar. 26, 1904.

¹⁸ Ann. de Derm. et de Syph., 1904, v, No. 5.

¹⁹ Med. Rec., Oct. 24, 1903.

²⁰ Amer. Med., Mar. 5, 1904.

²¹ Amer. Med., Mar. 5, 1904.

²² Univ. of California Publications, July 10, 1904.

is, therefore, rational, especially in those cases of diarrhea which accompany hysteria or nervous excitability of any sort. MacCallum also points out that the expulsion of saline enemas, which so commonly occurs from the stimulant action of the salt on peristalsis, may be prevented by the addition of a small amount of calcium chlorid to the enema.

Scopolamin.—B. Korff¹ reports 200 cases of scopolamin-morphin narcosis, and claims that in the doses he uses it is free from danger to the heart and lungs. The chief advantages are the absence of the tendency to vomit during and after the operation. He makes 3 injections, each containing $\frac{1}{24}$ grain of scopolamin and $\frac{1}{2}$ grain of morphin, the first $2\frac{1}{2}$ hours, the second $1\frac{1}{2}$ hours, and the third $\frac{1}{2}$ hour before operating. Volkmann² also favors this method of inducing anesthesia. Kochmann³ calls attention to the danger of this procedure. Out of 235 cases which he has collected there have been 2 deaths. [This method is based upon the fallacy that these 2 drugs are antagonistic in their action, except upon the brain. The truth is that both are pronounced depressants to the respiration.] K. Liepelt⁴ concludes, from his observations, that scopolamin ($\frac{1}{80}$ to $\frac{1}{60}$ grain) is more active than chloral or morphin as a sedative in delirium tremens and the excitement of mental disorders, and, moreover, is without unpleasant after-effects. M. Pickardt⁵ has found scopolamin ($\frac{1}{24}$ grain in water twice daily for weeks) very effective in 3 cases of excessive secretion of gastric juice.

Sodium Arsenate.—E. J. Moore⁶ finds that injections of this drug (1 ounce of a 1 % solution on 2 occasions at an interval of a week) into cattle exercise a most marked beneficial effect in cases of advanced tsetse-fly disease. He also suggests its employment in man, in whom single injections of 20 minims do not produce unpleasant effects.

Sodium Salicylate.—D. B. Lees⁷ recommends the use of this drug in large doses in chorea. He gives to children of 6 to 10 years 10 grains every 2 or 3 hours, and gradually increases the dose to 20 grains. Twice this amount of sodium bicarbonate is also administered. The drug should be stopped immediately if any symptoms of poisoning arise, especially "air-hunger." M. A. Zaoussailov⁸ reports 4 cases of chorea in which relief promptly resulted from a systematic course of sodium salicylate, although not a single feature suggested rheumatism. [It is remarkable that the stomachs of children tolerate such doses.] E. Knecht⁹ has studied the urine in 40 patients with rheumatism treated with sodium salicylate. In only 7 were any symptoms noted indicating irritation of the kidneys, and they were minimal in all but 2, the latter passing isolated tube-casts, others showing merely a slight albuminuria.

Solanum Carolinense.—Trusch's¹⁰ conclusions confirm the efficacy of the fluid extract of this drug in epilepsy. He has found it most effective in *grand mal*. In advanced cases its effect is not so lasting as that of

¹ Berl. klin. Woch., 1904, xli, No. 33.

² Therap. d. Gegenw., 1903, No. 5.

³ Therap. d. Gegenw., 1903, No. 6.

⁴ Brit. Med. Jour., Aug. 23, 1903.

⁵ Münch. med. Woch., 1904, li, No. 22.

⁶ Deut. med. Woch., Dec. 17, 1903.

⁷ Berl. klin. Woch., Apr. 11, 1904.

⁸ Lancet, July 2, 1904.

⁹ La Sem. méd., 1904, xxiv, No. 9.

¹⁰ Jour. de Méd. de Paris, 1904, No. 2.

the bromids, but the dermatoses and the depressant effect of the latter on the mind are avoided.

Spleen Pulp.—T. Landau¹ has discovered that the spleen pulp after antiseptic autolysis has remarkable hemostatic action. It does not act like adrenalin, but seems to influence the coagulating property of the blood, and controls bleeding from the capillaries. No action was observed on the arteries nor when the preparation (stagnin) was applied locally. Subcutaneous injections invariably arrested hemorrhage in a number of gynecologic cases.

Stovaine.—This is the name given to the hydrochlorate of benzoic ether of dimethylaminopropanol. According to P. Reclus,² it is fully the equal of cocain as a local anesthetic, while only half as toxic and very much less expensive. No by-effects were observed in the cases in which he used it for local analgesia or epidural injections. Pouchet and Huchard³ and De Lapersonne⁴ also speak well of stovaine.

Strontium Salts.—L. Mendel and H. Thacher⁵ find that these salts, irrespective of the method of administration, are eliminated to a relatively small extent only by the kidneys. Excretion in the urine begins soon and ceases usually within 24 hours. The larger portion of the strontium eliminated is found in the feces, being excreted by the intestine.

Strophanthus.—G. Guenther⁶ concludes, from experiments, that strophanthus is a pure poison for the cardiac muscle, killing warm-blooded animals by stopping the heart in diastole. The difference in the circulatory symptoms in poisoning from those produced by digitalis are chiefly the result of the absence of vagus irritation. The vasoconstrictor action of strophanthus being much less than that of digitalis, influences the picture of the poisoning process but little. The indications for using strophanthus in preference to digitalis are stated by O. T. Osborne⁷ to be as follows: When there is need of a cardiac tonic and digitalis produces nausea, vomiting, and too great an increase of the blood-pressure; when a cardiac tonic is indicated and the blood-pressure is already high; when a rapidly acting cardiac tonic is desired; when there are more nervous irritability and weakening of the heart than actual muscular debility or incompetency; children are very susceptible to the action of digitalis, and hence strophanthus is many times a better drug for them when a cardiac tonic is indicated.

Strychnin.—H. Haskins⁸ concludes, from experiments, that strychnin antagonizes to some extent the depressant action of alcohol. Although in no case was the strychnin competent completely to remove the effects of the large doses of alcohol which were employed, Haskins thinks it probable that appropriate doses of strychnin would prove useful in the treatment of poisoning from even lethal doses of alcohol. G. M. Hammond⁹ reports good results from the use of strychnin in massive

¹ Berl. klin. Woch., 1904, xli, No. 22.

² Bull. de l'Acad. de Méd., 1904, lxxviii, No. 27.

³ Bull. de l'Acad. de Méd., lxxviii, No. 28.

⁴ La Presse méd., Apr. 13, 1904.

⁵ Am. Jour. Physiol., 1904, No. 1.

⁶ Therap. Monatsh., 1904, No. 6.

⁷ Merck's Archives, Nov., 1903.

⁸ Am. Jour. Med. Sci., Dec., 1903.

⁹ Boston M. and S. Jour., Aug. 27, 1903.

doses ($\frac{1}{4}$ grain increased to $\frac{3}{4}$ grain thrice daily) in degenerative diseases of the nervous system, such as locomotor ataxia, progressive muscular atrophy, and optic-nerve atrophy. It is assumed that the strychnin improves the nutrition of the neurons in such a way as to arrest degeneration. S. Brown¹ also reports favorably upon the action of strychnin nitrate, when given subcutaneously, in progressive muscular atrophy.

F. Sartsin² reports the results obtained in 9 cases of sciatica treated by injections of strychnin nitrate ($\frac{1}{80}$ — $\frac{1}{50}$ grain) into the gluteal region, at intervals of one to several days. In 4 the pain entirely disappeared; in 3 there was distinct improvement, and in 2 no result. L. Feilchenfeld³ reports 2 cases of diabetes insipidus and B. Leick⁴ a third case, in which considerable diminution in the quantity of the urine resulted without change in the specific gravity, from hypodermatic injections of strychnin nitrate ($\frac{1}{5}$ to $\frac{1}{15}$ grain).

R. C. Cabot⁵ states, as the result of observations on 31 patients with febrile diseases, that he was unable to convince himself that strychnin (by mouth or subcutaneously in daily doses of $\frac{1}{4}$ grain) exerts any influence upon the blood-pressure in febrile cases. G. W. Crile,⁶ in an experimental study of the effect of strychnin in shock, found that in cases in which the shock was nearly to the fatal degree strychnin caused a slight rise of blood-pressure, lasting a few minutes, after which no amount of the drug produced a rise. In any degree of shock less than fatal after the administration of a therapeutic dose of strychnin the animal passed into a deeper degree of shock.

Styptol.—This is a neutral phthalate of cotarnin, a base obtained by oxidizing narcotin. R. Katz⁷ and K. Witthauer⁸ have found it useful in arresting uterine hemorrhage in cases in which uterine contraction is not essential. The drug is said to cause no disagreeable after-effects and to be much cheaper than stypticin.

Sublamin.—This is a compound of mercury sulfate and ethylene-diamin. W. Gottheil⁹ found it useful in an epidemic of *Tinea tonsurans* comprising 450 cases. In a solution of 1:1000 it proved less irritating and more effective than corrosive sublimate.

Tetanus Antitoxin.—H. Murphy¹⁰ reports a case of tetanus (incubation period, 10 days), and H. Black¹¹ 2 cases (incubation period respectively 9 days and 16 days), in which recovery followed under treatment with antitetanic serum administered subcutaneously. Blumenthal¹² reports 2 cases, and Tournan¹³ 3 cases, in which the antitoxin was without favorable influence. M. Letulle¹⁴ urges the general adoption of the Calmette method of treating wounds likely to give rise to tetanus. This method consists in washing out the wound with boiled water for 15 minutes, then dusting it thick with dried, powdered antitetanus serum, and covering with gauze.

¹ Med. Rec., Aug. 6, 1904.

² Deut. med. Woch., 1903, No. 31.

³ Amer. Med., July 2, 1904.

⁴ Therap. Monatsh., June, 1903.

⁵ Med. News, Oct. 17, 1903.

⁶ Amer. Med., Oct. 1, 1904.

⁷ Deut. med. Woch., 1904, xxx, No. 10.

⁸ Roussky Vrach, Oct. 11, 1903.

⁹ Deut. med. Woch., 1904, No. 33.

¹⁰ N. Y. Med. Jour., Sept. 24, 1904.

¹¹ Zent. f. Gynäk., Aug. 20, 1904.

¹² Lancet, Mar. 5, 1904.

¹³ Wien. klin.-therap. Woch., 1904, No. 1.

¹⁴ La Presse m'ed., 1904, No. 57.

A. Elting¹ reports 3 cases of tetanus, 2 of which were acute, treated by subdural injections of antitoxin. Death followed in the acute cases, and recovery in one, with an incubation period of 9 days. J. Rogers² reports a severe case with an incubation period of 14 days in which recovery followed under subdural injections. C. Wille³ reports a case (incubation period of 5 days) terminating fatally after intraspinal injections. Wallace and Sargent⁴ report 4 cases (periods of incubation respectively 3, 6, 9, and 11 days) treated by subdural injections. All ended in recovery except the one with an incubation period of 6 days.

J. Sicard,⁵ of Paris, who was the first to administer tetanus antitoxin by the subarachnoid route, states that besides the 20 cases published by Vallas last year, he knows of 6 cases thus successfully treated (2 personally observed), with another which terminated fatally.

Theocin.—This is a synthetic xanthin derivative differing from theobromin only in the position of its methyl groups. H. Dreser⁶ reports that as a diuretic it is the most powerful of the purin-bases. L. Alkan and J. Arnheim⁷ find theocin indicated in all dropsies of cardiac, hepatic, or renal origin, except that of acute nephritis. Its action is powerful, but evanescent, lasting at the longest only 48 hours, and its effect must be followed by digitalis or some other diuretic. It acts by stimulating the renal epithelium and not by increasing blood-pressure. K. Thienger⁸ has tried theocin in 17 cases and find it more active as a diuretic than theobromin. The effect, however, was of short duration. Mostly the drug was well borne, but in a few cases it caused anorexia, nausea, vertigo, and headache, and once vomiting and an epileptic fit.

H. Kramer⁹ concludes, from his experience with theocin, that it is a valuable and rapidly acting diuretic which rarely fails and is more powerful than either agurin or diuretin. He hopes, however, that a preparation will be found that will prove equally effective without causing nausea and vomiting. K. Hess¹⁰ and A. Dwiejiluy¹¹ report favorably upon theocin; the latter, however, found gastric distress a frequent by-effect. A. Strass¹² has found it in most cases a valuable diuretic, but only when no heart-failure or lowering of blood-pressure was present. S. S. Cohen¹³ states that theocin must be used with caution; that, used too continuously, it causes suppression of urine, in part by mechanically blocking the tubules with crystalline deposit. Pauli¹⁴ prefers theobromin to theocin, since he has observed in 3 cases, after the use of the latter, nausea, vomiting, and extensive urticaria. The dose of theocin is from 3 to 8 grains, well diluted, after meals.

Thiosinamin.—P. Lengemann¹⁵ reports additional cures from injections of thiosinamin (a compound produced by acting on the volatile

¹ Albany Med. Annals, Jan., 1904.

² Jour. Am. Med. Assoc., Aug. 27, 1904.

³ Jour. Am. Med. Assoc., Nov. 21, 1903.

⁴ Therap. Monatsh., Jan., 1904.

⁵ Münch. med. Woch., Mar. 31, 1903.

⁶ Roussky Vrach, Mar. 13, 1904.

⁷ Amer. Med., July 30, 1904.

⁸ Deut. med. Woch., 1904, xxx, No. 13.

⁹ Med. Rec., May 21, 1904.

¹⁰ Lancet, Mar. 5, 1904.

¹¹ Edinburgh Med. Jour., Feb., 1904.

¹² Münch. med. Woch., July 28, 1903.

¹³ Therap. Monatsh., 1903, xvii.

¹⁴ Wien. klin. Rundschau, 1903, No. 50.

¹⁵ Wien. klin. Woch., 1904, No. 17.

oil of mustard with ammonia) in cases of Dupuytren's contraction, and states that the fine results obtained have lasted for more than a year. M. Glogner¹ reports 3 cases of cicatricial stenosis of the pylorus in which he used subcutaneous injections of thiosinamin (10 % to 15 % glycerin-water solution), using, in the course of 6 or 8 weeks, from 20 to 35 grains of the drug. In 2 cases there was no effect, but in the third there was marked improvement. A. Hartz² also reports a case of stenosis of the pylorus in which apparent cure resulted from thiosinamin injections. R. Baumstark³ observed improvement in 2 cases of perigastric adhesions, but none in 4 cases of benign stenosis of the pylorus after injections of thiosinamin. As the symptoms returned in the first 2 cases after the suspension of other therapeutic measures, he is not disposed to attribute the good results to the use of the drug.

Thyroid Extract.—Sturmer⁴ reports 41 cases of puerperal eclampsia treated by thyroid extract (10 grains on admission and 5 grains every 4 hours afterward). Under this treatment the mortality was 12.2 %, whereas in a series of 369 cases under other treatment the mortality was 28.7 %. V. Baldovsky⁵ also reports the success of the thyroid treatment in 2 cases of eclampsia.

Trypan Red.—Ehrlich and Shiga⁶ find that this remedy is distinctly valuable in trypanosoma affections. It has no direct influence on the parasites, but it induces a reaction in the body which entails their destruction.

Urotropin.—E. Fuchs⁷ recommends the remedy in typhoid fever as a preventive of bacteriuria. In 75 cases in which the drug was not given bacteriuria occurred in 26, whereas in 40 cases in which it was given bacteriuria occurred but once. Widowitz⁸ urges the use of urotropin in scarlatina as a preventive of nephritis. In 102 cases (children) of scarlatina in which the drug was used early, and again at the beginning of the third week, nephritis did not appear once. Buttersack⁹ also reports 10 cases of scarlatina treated with urotropin, in none of which nephritis developed.

Veronal.—This compound belongs to the urea group of hypnotics, being chemically diethylmalonylurea. It is a white, crystalline powder, soluble in about 12 parts of boiling water and in 145 parts of cold water. The dose is from 8 to 15 grains. N. Botcheroff¹⁰ finds that it paralyzes the central nervous system in animals, acting especially upon the cerebrum. It produces a prolonged sleep, followed, after large doses, by depression. Its action resembles that of trional, but is without the untoward effects of the latter, and its prolonged use is safer. W. Fischer¹¹ has employed veronal in 83 cases, representing various psychic conditions. It acted well in 60 cases, accumulatively in 1 case, not at all in 5 cases, and slightly in 6 cases. Good sleep with interruptions was produced in¹² 4

¹Therap. d. Gegenw., 1904, xlv, No. 7.

²Deut. med. Woch., 1904, xxx, No. 8.

³Berl. klin. Woch., 1904, xli, No. 24.

⁴Lancet, Apr. 16, 1904.

⁵Vratcheb. Gazeta, 1904, xi, No. 1.

⁶Berl. klin. Woch., 1903, xli, No. 14.

⁷Deut. Arch. f. klin. Med., 1904, Nos. 1-3.

⁸Wien. klin. Woch., Oct. 1, 1903.

⁹Deut. Arch. f. klin. Med., 1904, Nos. 3, 4.

¹⁰Roussky Vratch, Feb. 7, 1904.

¹¹Therap. Monatsh., Aug., 1903.

cases. Unpleasant symptoms were noted in 7 cases. These consisted of dulness in the head, sleepiness, nausea, or vomiting. Aside from these 23 cases, the action of veronal was very good. It produced a quiet, dreamless sleep, lasting from 6 to 10 hours, after which the patient awoke refreshed.

S. Ajells,¹ L. Weber,² R. Michel and E. Raimann,³ Schule,⁴ T. Offer,⁵ L. Wiener,⁶ R. Bartholow,⁷ O. Matthey,⁸ H. Raschkow,⁹ I. Petchinkoff,¹⁰ A. Jordan¹¹ also speak very favorably of this hypnotic. R. Landenheimer,¹² while agreeing with other writers as to the value of veronal, reports a case illustrating the possibility of habituation. G. Clarke¹³ reports a case of poisoning with veronal (24 grains) in a girl of 19 years. The symptoms were those of narcotic poisoning. The following day there was a universal erythematous rash. After a second dose the same rash appeared, and, in addition, the patient had periodic attacks of delirium. A strong purgative proved quickly effective. A. Homburger¹⁴ attributes the cumulative action of both veronal and trional to constipation. When this is combated, the drugs are eliminated and accumulation does not occur.

¹ Gaz. med. Siciliana, 1903, No. 20.

² Deut. med. Woch., 1903, No. 40.

³ Die Heilkunde, Jan., 1904.

⁴ Die med. Woch. u. Bal. Cent., 1903, iv, No. 31.

⁵ Zent. f. d. ges. Therap., 1903, vii, No. 21.

⁶ Wien. med. Presse, 1903, No. 24.

⁷ N. Y. Med. Jour., Sept. 19, 1903.

⁸ Neurol. Zent., 1903, No. 19.

⁹ Wien. klin. Rundschau, 1903, No. 41.

¹⁰ Roussky Vrach, July 3, 1904.

¹¹ Lancet, Mar. 5, 1904.

¹² Therap. d. Gegenw., 1904, No. 1.

¹³ Lancet, Jan. 23, 1904.

¹⁴ Therap. d. Gegenw., 1904, xlv, No. 7.

PHYSIOLOGY.

By G. N. STEWART, M. D.,
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SUMMARY.

Among the most interesting contributions during the year are the observations of Ducceschi, L. Loeb, and Morawitz on coagulation of the blood; of Peskind, Koeppe, Ford and Halsey, etc., on agglutination and hemolysis; of Carlson on the origin of the heart-beat; of Hering on the restoration of function of the heart-nerves; of Brodie and Dixon and Plumier on the vasomotors of the lungs; of Howell and Porter on shock; of Hill and Macleod on caisson illness; of Eykman on deglutition; of Magnus on the movements of the intestine; of Bancroft and Starling on the relation of blood-flow to secretion in the pancreas; of Bainbridge on the adaptation of the pancreatic juice to the food; of Moore on the place of the synthesis of the absorbed soaps and fatty acids; of Fraenkel on the internal secretion of the corpus luteum; of Langley, Mott, etc., on regeneration of nerve-fibers; of Grünbaum and Sherrington on cortical areas; of Loeb on fertilization; of Mathews on the physiologic action of elements; of Kurdiowski on the actions of the isolated uterus; of London and others on radium rays; of Blondlot and Charpentier on N-rays.

BLOOD.

Coagulation.—V. Ducceschi¹ states that if a few drops of (human) blood are placed in a watch-glass, the formation of clumps of agglutinated blood-plates in the form of minute white points visible to the eye may be seen to occur next the glass within 40 seconds to 2 minutes. The phenomenon precedes coagulation, and is prevented by the addition of ammonium oxalate. After the blood has coagulated, the clumps cannot be detected. Strong evidence of the importance of the platelets in coagulation is also adduced by K. Bürker.² He uses a novel and simple method of isolating them. A drop of blood is placed on a smooth and clean piece of paraffin and kept in a moist chamber. Clotting is long delayed, and the white and colored corpuscles sink to the bottom, while the platelets rise to the top of the drop, from which they can be removed by a cover-slip. He concludes that the breaking-up of the platelets is an indispensable condition for coagulation, since the quantity of fibrin ultimately formed depends on the number which has disap-

¹ Arch. Ital. de Biol., Sept. 10, 1903.

² Pflüger's Arch., Bd. cii, S. 36.
517

peared, and all agents which favor the decomposition of the platelets favor clotting. [But while most observers who grant to the blood-plates an important role in coagulation consider them a source of fibrin-ferment, Bürker puts forward the view—and supports it by plausible arguments—that it is the fibrinogen which comes from them.] He calculates that the destruction is sufficiently great to account quantitatively for the whole of the fibrinogen. On the other hand, J. H. Pratt¹ denies that there is any direct relation between the time of clotting and the number of blood-plates. I. Morawitz² asserts that fibrin-ferment is produced by the interaction of 3 substances: thrombogen, thrombokinase, and a calcium salt. Thrombogen is found exclusively in blood and lymph, probably not in solution, but mainly in the blood-plates. But thrombokinase, which has itself many of the properties of a ferment, can be obtained from all the tissues. In ordinary coagulation the kinase is derived chiefly from the blood-plates or leukocytes. [Just as enterokinase activates trypsinogen, changing it into fully formed trypsin] thrombokinase is supposed to activate thrombogen, changing it into effective fibrin-ferment. Only a portion of the thrombogen is thus activated in ordinary clotting. Some of it remains unaltered in the serum and can be changed to active fibrin-ferment in the presence of kinase and Ca salts. The circulating plasma does not clot, because it contains no thrombokinase and probably no thrombogen. Fuld³ and A. W. Hewlett⁴ have independently arrived at a very similar result, viz., that in the formation of fibrin-ferment several substances act together, one of which, at least, is contained in tissue extracts. Mura-schew⁵ has confirmed the assertion of L. Loeb,⁶ that while the thrombin [active fibrin-ferment] of any particular kind of vertebrate blood has no marked specific action, that is, will cause coagulation in solutions of fibrinogen or plasma of very different origin, the thrombins of all vertebrates, *e. g.*, bringing about clotting in goose's serum, the thrombokinase and thrombogen of vertebrates are distinctly specific bodies. Sometimes the specificity is absolute, sometimes relative.

The **relation of calcium to coagulation** has been investigated by L. Sabbatani,⁷ who announces that Ca exists in blood in the ionic condition, and that the amount of ionized Ca necessary for coagulation is exceedingly small—much less than the total quantity present in the blood. If the concentration of the Ca ions falls below or rises above a certain limit, coagulation does not occur. He points out, as an interesting corollary, that the anticoagulant activity and the general toxic power of a series of decalcifying agents run parallel. According to M. Carrara,⁸ the blood of asphyxiated animals (rabbit, dog) [contrary to

¹ Arch. f. exper. Path. u. Pharm., Bd. xlix, S. 299; Zent. f. Physiol., Bd. xvii, S. 492.

² Hofmeister's Beit., Bd. iv, S. 381; Bd. v, S. 133; Deut. Arch. f. klin. Med., Bd. lxxix, S. 1.

³ Zent. f. Physiol., Dec. 19, 1903.

⁴ Arch. f. exper. Path. u. Pharm., Bd. xlix, S. 319.

⁵ Deut. Arch. f. klin. Med., Bd. lxxx, S. 187.

⁶ Montreal Med. Jour., July, 1903.

⁷ Arch. Ital. de Biol., vol. xxxix, p. 333.

⁸ Ibid., vol. xxxix, June 10, 1903; Med. News, Aug. 29, 1903.

the usual statement], clots even more rapidly than that of normal animals, which he attributes to increased ionization of Ca [on somewhat theoretic grounds, however, and without making out a very convincing case].

T. Landau¹ announces that by antiseptic autolysis of the spleen he has been able to isolate a preparation, "**stagnin**," which has a powerful effect in controlling hemorrhage, probably by increasing the coagulability of the blood. It has been tried with good results in gynecologic cases and in one case of hemophilia.

Viscosity of Blood.—F. Lommel² has studied the influence of sweating on the viscosity of the blood. In the great majority of cases [as was to be expected] the viscosity increases, owing to the loss of water. This is in accordance with the results of Burton-Opitz,³ who finds that the specific gravity and viscosity of blood always vary in the same direction. The injection of alcohol into the stomach increases the viscosity, as does the subcutaneous injection of curare; the injection of normal saline solution into the blood diminishes its viscosity. Venous blood is slightly more viscous than arterial. According to C. Ferrai,⁴ however, there is a marked increase in the viscosity of the blood in asphyxia. It may become double that of arterial blood, and increases in proportion to the increase of CO₂. [One element in this increase may be the swelling of the corpuscles under the influence of CO₂, since the addition of CO₂ to serum, even to saturation, does not increase its viscosity.] G. Rossi,⁵ repeating and extending the observations of Burton-Opitz⁶ and A. Mayer⁷ on the influence of temperature on the viscosity of blood-serum, noted a rather sudden change about the temperature of 45° C., which is revealed by a marked diminution in the rate at which the viscosity declines and the electric conductivity increases with the increase of temperature.

Volume of Corpuscles and Plasma.—As a further illustration of the interest which the investigation of the physical properties of the blood is exciting not only among physiologists, but also among clinicians, may be mentioned the work of P. Fraenckel⁸ on the relative volume of corpuscles and plasma (or serum), as estimated by the electric method elaborated by the author of this abstract.⁹ He has compared this method with the Bleibtreu chemic method¹⁰ [as the author did with Hoppe-Seyler's chemic method¹¹]. He finds a satisfactory agreement, and recommends the method for scientific and clinical purposes [but his statement that a determination can be carried out in an hour and with

¹ Berl. klin. Woch., Bd. xli, S. 577; Biol. Zent., Bd. iii, S. 26.

² Deut. Arch. f. klin. Med., Bd. lxxx, S. 308.

³ Proc. Soc. Exper. Biol. and Med., Dec. 16, 1904.

⁴ Arch. di Fisiol., vol. i, p. 385.

⁵ Ibid., p. 500.

⁶ Pflüger's Arch., Bd. lxxxii, S. 64.

⁷ Compt. rend. de la Soc. de Biol., vol. liv, p. 367.

⁸ Zeit. f. klin. Med., Bd. lii, Hefte 5 u. 6, 1904; Biol. Zent., Aug., 1904, Bd. iii, S. 18.

⁹ Jour. Physiol., 1899, vol. xxiv, p. 356; Zent. f. Physiol., 1897, Bd. xi.

¹⁰ Pflüger's Arch., Bd. lv, S. 151; *ibid.*, Bd. lx, S. 405.

¹¹ Handb. d. physiol.-chem. Analyse, seventh edition, S. 501.

15 to 20 cc. of blood is far too unfavorable to the method. A determination really requires only a few minutes, and with the capillary tubes used by T. M. Wilson¹ only 5 drops of blood]. Wilson has compared the electric and hematokrit methods (without the addition of any diluting solution) for normal blood and for blood containing a great excess and a great deficiency of corpuscles, and reports that there is a close agreement. [This is good evidence that the hematokrit, when undiluted blood is employed, gives sufficiently accurate results, and rebuts the criticism to which that method has been subjected, that in the centrifugalization even of blood unmixed with any solution liquid might be squeezed out of the corpuscles and the volume of the plasma be thus artificially increased. The electric method, however, gives at the same time the volume of the corpuscles and the conductivity of the plasma, a physical quantity from which important physiologic and clinical conclusions may be deduced, since it is a measure of the concentration of the electrolytes in that liquid.] J. A. Capps² has published an investigation on the "volume index" [which is a measure of the average volume of a corpuscle³] in various diseases.

Osmotic Pressure of Corpuscles and Serum.—C. Foa⁴ has compared the freezing-points of serum and of the corresponding blood laked by alternate freezing and thawing, with the result that in the case of blood with nonnucleated corpuscles the serum freezes at a lower temperature than the laked blood. He accordingly comes to the astonishing conclusion that the corpuscles and plasma are not in osmotic equilibrium, the osmotic pressure of the corpuscular contents being permanently less than that of the plasma. This conclusion has been criticized by P. Enriques.⁵ [In our opinion, justly. The difference in the freezing-points, if it really exists, might be due to the retention in the stromata of a part of the salts, while water, with the hemoglobin, passes out in larger amount. Foa proves, indeed, for horse's blood, that a portion of the salt does leave the corpuscles in this form of laking. This was the result reached by Stewart,⁶ although Foa wrongly attributes to him the statement that none of the salts escape. But he has not shown that we can safely deduce the osmotic pressure of the contents of the corpuscles from that of the extracorporeal liquid of the laked blood.]

Hemolysis.—S. Peskind⁷ has made a careful quantitative study of laking by ether, and sums up in favor of the hypothesis that the cause of ether laking is the solution and extraction (or if not that, then the modification) of the cholesterol and lecithin in the envelop of the corpuscle. H. Koeppe⁸ concludes [and this has indeed been a familiar idea to most observers who have worked much with physical and chemie laking agents, and has been advanced before] that laking occurs when the properties of the envelop of the corpuscle as a semipermeable membrane are injured. Substances like ether, chloroform, alcohol, acetone,

¹ Am. Jour. Physiol., vol. xii.

² Jour. Am. Med. Assoc., Feb. 16, 1901.

³ Ibid., p. 339.

⁴ Am. Jour. Physiol., vol. xii, p. 184.

⁵ Jour. of Med. Research, vol. x, p. 367.

⁶ Arch. di Fisiol., vol. i, pp. 199 and 342.

⁷ Jour. Physiol., 1899, vol. xxiv, p. 211.

⁸ Pflüger's Arch., Bd. xcix, S. 33.

etc., which dissolve fat, may injure the envelop by their action on its fatty constituents. The action of acids may be due to the H ions hastening, as catalyzers, the splitting of esters in the envelop while alkalis may cause the saponification of the esters under the influence of hydroxyl ions.

C. C. Guthrie¹ has shown that formaldehyd injected intravenously into dogs in the proportion of 1:900 to 1:740 of the total blood, and CaCl_2 in the proportion of 1:4000, cause for a time distinct inhibition of the hemolytic power of the serum for rabbit's corpuscles. Guthrie² had previously demonstrated a similar effect for formaldehyd, and Hektoen and Rüdiger³ a similar effect for CaCl_2 *in vitro*, an action further studied by Mainwaring⁴ and shown to be due to the influence of CaCl_2 on the complement and not on the intermediary body.

S. J. Meltzer and W. Salant⁵ state that the serum of rabbits after nephrectomy contains an antihemolysin which hinders the normal hemolytic action of bullock's serum on the rabbit's corpuscles. It is destroyed by heating to 58° for one hour.

Agglutininogens and Hemolysinogens.—G. N. Stewart⁶ has shown that the substances in blood-corpuscles which, on injection into animals of a different species, cause the production of agglutinins and hemolysins, cannot pass through the pores of unglazed clay. Contrary to the statements of Bordet,⁷ von Dungern,⁸ and P. Nolf,⁹ he finds that it is not in general possible to separate completely the agglutininogenic from the lysinogenic action by injecting into animals either the washed stromata or the hemoglobin-containing liquid of foreign corpuscles laked in various ways (heat, freezing and thawing, foreign serum, saponin, water), a conclusion simultaneously arrived at for water-laked corpuscles by W. W. Ford and J. T. Halsey.¹⁰

Influence of Injection of Various Substances on Blood-corpuscles.—S. Saweliew¹¹ asserts that injection of **adrenalin** is followed by distinct alterations in the number of polynuclear leukocytes, which are diminished immediately after the injection but soon increase again, reaching a maximum in about 3 hours. A relative immunity to this reaction is established by giving repeated doses of adrenalin. O. Hess,¹² on injecting suprarenin, saw a marked increase in the relative number of erythrocytes and in the hemoglobin in the venous blood, while in the arteries the blood remained unaltered in this regard. He attributes the change in the veins to the increased loss of water in the capillaries, owing to the increase of blood-pressure. [It is known that the reactions caused in the dog by rapid intravenous injection of albumose are not

¹ Am. Jour. Physiol., vol. xii, p. 139.

² Ibid., vol. ix, pp. 79, 191.

³ Proc. Chicago Path. Soc., 1903, vol. v, p. 303; Biol. Zent., Bd. iii, S. 33.

⁴ Jour. Infect. Dis., vol. i, p. 112.

⁵ Med. News, June 4, 1904.

⁶ Am. Jour. Physiol., vol. xi, p. 250; vol. xii, p. 363.

⁷ Ann. de l'Institut Pasteur, vol. xiv, p. 257.

⁸ Münch. med. Woch., Bd. xlvi, S. 449.

⁹ Ann. de l'Institut Pasteur, vol. xiv, p. 297.

¹⁰ Jour. of Med. Research, vol. xi, p. 403.

¹¹ St. Petersburg. Diss., 1904; Biol. Zent., Bd. iii, S. 39.

¹² Deut. Arch. f. klin. Med., Bd. lxxix, Nos. 1 and 2.

characteristic merely of this substance, but can be produced by many others, *e. g.*, organ-extracts, venoms, certain bacterial toxins, milk, etc.] P. Nolf¹ finds that both serum-albumin and serum-globulin produce the effects of albumose (diminution in the number of leukocytes, incoagulability of the blood, and fall of arterial pressure). As to the cause of the hypoleukocytosis brought about by albumose, he states that it is due to retention of leukocytes in the abdominal vessels whose walls are especially susceptible to the action of this substance.

Blood of the Newborn.—A. O. M. Fehrsen² has made an elaborate study of the number of colored corpuscles and the hemoglobin content in the blood of 40 newborn children. [While, perhaps, nothing absolutely new has been made out, he has rendered more precise our knowledge of this subject.] The percentage of hemoglobin and the number of erythrocytes are high (110 % to 115 % of hemoglobin and over 6,000,000 corpuscles to the c.mm.). A well-marked leukocytosis (18,000 per c.mm.), an absolute and relative increase in the lymphocytes and large mononuclear leukocytes, and the invariable presence of nucleated colored corpuscles up to the third hour after birth are definitely established.

Reaction of Blood.—R. Höber³ has investigated, by the aid of his previously described physicochemic method,⁴ more thoroughly tested in certain points, the reaction of blood. In confirmation of the results of previous workers⁵ he reports that ox-blood is an almost neutral liquid when it contains a quantity of CO₂ within the physiologic limits—*i. e.*, the concentration of hydroxyl ions in it differs little from that in pure water. The same is true for the defibrinated blood of other mammals (dog, sheep, pig, rabbit). Unclotted blood has exactly the same reaction as defibrinated. Blood contains somewhat more OH ions than serum of the same CO₂ tension. The difference can be explained on the assumption of Koeppé and Hamburger⁶ by the interchange of HCO₃ and Cl between the corpuscles and serum. H. Friedenthal⁷ states that a liquid containing in the liter 6 gm. NaCl, 4 gm. NaHCO₃, 0.3 gm. KCl, 0.3 gm. Ca(H₂PO₄)₂, and 2 gm. dextrose has the same reaction as serum (measured by the physicochemic method, or, under proper conditions, by color indicators), and also the same marked resistance to change of reaction which is characteristic of blood-serum and which insures that no great variation from neutrality can take place except as a result of considerable chemic changes.

CIRCULATION.

The Heart-beat.—[What appears to be decisive evidence on the long-pending question whether the beat of the heart is of muscular or

¹ Arch. internat. de Physiol., vol. i, p. 494; Arch. de Biol., vol. xx, p. 23.

² Jour. Physiol., vol. xxx, p. 322.

³ Pflüger's Arch., Bd. xcix, S. 572.

⁴ Ibid., Bd. lxxxi, S. 522.

⁵ YEAR-BOOK of Medicine, 1904, p. 508.

⁶ Osmot. Druck u. Ionenlehre, 1902, S. 278. YEAR-BOOK of Medicine, 1903, p. 553.

⁷ Ver. d. Berl. physiol. Ges.; Arch. f. (Anat. u.) Physiol., 1903, S. 550.

of nervous origin] has been brought forward by A. J. Carlson¹ for the heart of *Limulus* (the horseshoe- or king-crab), which, according to him, will not go on beating rhythmically after separation from its nervous mechanism, an operation which is rendered easy, without injury to the heart, by the peculiar arrangement of the cardiac ganglions and nerves. He also believes he has obtained proof that coördination of the various portions of the heart and conduction of the contraction are due to nerves. [How far these results are capable of being transferred to the hearts of highly organized animals he wisely abstains from dogmatizing upon, while pointing out the resemblances in the activity of the vertebrate heart and that of the invertebrate heart investigated which would indicate the fundamental similarity of the processes involved in the rhythmic beat.] On the other hand, the observations of M. Humblet,² that the section of a muscular band, in the dog, which, arising in the interauricular septum, passes downward and forward to blend with the musculature of the ventricles, produces allorhythmia, may be looked upon by the supporters of the theory of muscular conduction as in favor of their view [unless, indeed, as is perfectly possible, damage is at the same time done to the nerves by this operation].

The possibility of restoration of the mammalian heart many hours after somatic death by perfusing blood or an artificial nutrient liquid through the coronary circulation is considered by H. E. Hering³ and others a strong argument for the myogenic theory, since, according to them, it is improbable that ganglion-cells, which elsewhere are physiologically fragile structures, should in the heart retain their vitality for so long a time. [But it is easy to overdo this argument, and we must not assume without proof that ganglion-cells in all parts of the body have an equal capacity of survival. It may well be that the cardiac ganglions, like the heart-muscle, are endowed with exceptional powers of resistance to those changes which constitute death. The possibility, or rather probability, must also not be overlooked that although normally the automatic ganglions initiate the beat, the heart-muscle itself possesses the capacity for rhythmic contraction, which under certain conditions (in isolated strips of the tortoise ventricle, *e. g.*, and perhaps in the case of the whole heart when restored a long time after somatic death) can be exercised independently of the ganglions. It would seem an advantageous arrangement that an organ like the heart, destined to beat rhythmically, should be composed of muscular tissue itself endowed with a high degree of rhythmic power, although under normal conditions exercising that power at the instance and under the guidance of an automatic nervous mechanism. We might suppose, *e. g.*, that the "threshold value" of the internal stimulus to contraction in the cardiac muscular fibers is periodically lowered by the rhythmic discharges from the automatic nervous mechanism.]

E. G. Martin,⁴ as the result of renewed study of isolated strips of the turtle's ventricle, concludes that the simple theories thus far pro-

¹ Am. Jour. Physiol., vol. xii, p. 67.

² Arch. internat. de Physiol., vol. i, p. 278.

³ Pflüger's Arch., Bd. xcix, S. 245.

⁴ Am. Jour. Physiol., vol. xi, p. 103.

posed in explanation of the reactions of the heart-muscle to salts, in which the effects are all attributed to mere diffusion into the muscle or out of it of one salt or another, are insufficient. He suggests that the liberation of energy in the ventricular tissue depends on the presence in it of Ca in diffusible form, but that most of the Ca normally present is in an indiffusible inert form. One effect of stimulation upon the tissue may be to convert indiffusible into diffusible Ca. [But that no one inorganic salt will suffice to maintain the activity of the heart has been demonstrated anew] by E. Gross,¹ who, working with the isolated mammalian heart, has assured himself that all the salts (or their kations) in Ringer's solution are indispensable for long-continued action or restoration of the heart, not because in this concentration they directly stimulate the cardiac muscles, but because their presence constitutes a necessary condition, just as a definite range of temperature or a definite range in the oxygen-content of the circulating liquid does.

Exercise and Pulse-rate.—W. T. Bowen² has studied the changes in the heart-rate, blood-pressure, and duration of the systole in bicycle exercise. During moderate exercise there is first a rapid increase in the pulse-rate, lasting 1 to 3 minutes, and then a gradual secondary rise as the work continues. The blood-pressure mounts rapidly when the work begins and gradually falls during its continuance, with an abrupt decline to normal or below it on cessation of work. The systole is suddenly lengthened at the start, and then gradually shortens as the work goes on. T. Tewildt³ asserts that the acceleration produced by exercise in persons in good health does not depend so much on the duration of the exercise as upon its intensity for the time it lasts. Moderate exercise does not increase the frequency of the pulse, even when continued for a long time, nearly so much as violent exercise for a short time.

Intermittent Pulse.—[The results of Engelmann and others on disturbances of the cardiac rhythm produced experimentally have led to interesting clinical studies of the various forms of arrhythmia, *e.g.*, by J. Mackenzie,⁴ Wenckebach,⁵ and H. E. Hering.⁶] The last-named observer has laid special stress on the production of extra systoles as the great cause of the pulsus intermittens. D. Gerhardt⁷ has confirmed this view in numerous instances, but now adduces a case of articular rheumatism in which the graphic record showed that during each intermittence of the arterial pulse there was an elevation in the venous pulse-tracing, and this was exactly where the elevation due to the auricular contraction ought to have been in the normal rhythm. Here, therefore, the auricle was beating in normal rhythm, while the corresponding ventricular contraction was missed.

Heart Nerves.—G. Fano⁸ states that during weak stimulation of the vagus causing incomplete inhibition of the heart an inversion of the electric rhythm, determined by an augmentation of the positive phase

¹ Pflüger's Arch., Bd. xcix, S. 264.

² Am. Jour. Physiol., vol. xi, p. 59.

³ Pflüger's Arch., Bd. xcvi, Nos. 7 and 8.

⁴ The Study of the Pulse, Edinburgh and London.

⁵ Die Arrhythmie des Herzens, Leipzig, 1903.

⁶ Prager med. Woch., July, 1903.

⁷ Arch. f. exper. Path. u. Pharm., Bd. li, S. 11.

⁸ Arch. di Fisiol., vol. i, p. 249.

of the action current and a diminution of the negative phase, can be observed by means of the capillary electrometer or galvanometer, each negative variation corresponding to contraction being followed by a positive variation corresponding to relaxation. He considers this an objective foundation for the doctrine of anabolism, as Gaskell concluded from his observations on the quiescent heart of the tortoise.¹ [But while there is no question that a positive variation accompanies every relaxation of the heart, there is no proof, as was pointed out long since by Stewart,² that this indicates that reversal of the chemic action in the heart which is generally understood by anabolism.]

A. J. Carlson³ has demonstrated, in opposition to the view of Gaskell,⁴ that stimulation of the cardioaccelerator nerves (in mollusks) when the heart is perfectly quiescent is followed by rhythmic contractions. [This is quite in accordance with the experience of the author⁵ of this abstract in the case of the frog's heart in heart standstill.]

H. E. Hering⁶ has investigated the question how long the cardiac nervous mechanism survives somatic death. In one experiment the heart of an anthropoid ape was revived by the artificial circulation of Ringer's solution, when 3 successive periods, viz., $4\frac{1}{2}$, $28\frac{1}{2}$, and 53 hours respectively, had elapsed after the death of the animal, although during the last period the heart had twice been frozen hard. The vagus was shown to be still capable of acting on the heart 6 hours after death, and the accelerans as late as 53 hours after death. Among other conclusions he points out that this indicates strongly, in the case of the accelerans at any rate, that the intracardial nervous mechanism does not contain ganglion-cells, since their vitality cannot be supposed to persist so long, and since sympathetic ganglions outside of the heart can be shown to be incapable of restoration of function by Ringer's fluid after such long intervals. [The remark we have made above in connection with the same argument as applied to the question of the existence of automatic ganglions in the heart might be repeated here. It is not impossible that intracardial ganglion-cells have a specially high degree of resistance.] Kuliabko,⁷ continuing his researches on the resuscitation of the isolated hearts of persons dead of various diseases, finds that success depends upon the nature [or intensity] of the disease, as well as upon the interval that has elapsed since somatic death [although his results do not indicate why in one case restoration should be relatively easy and in another difficult or impossible]. He obtained more or less complete restoration of the heart-beat in cases of pneumonia, complicated with septicemia or gastrointestinal catarrh; bronchitis, combined with peritonitis or meningitis; and cholera infantum. He was unsuccessful in cases of diphtheria complicated with septicemia or erysipelas, and in cases of pleurisy with effusion.

¹ Ludwig's Festschrift, 1887, S. 114.

² Jour. Physiol., vol. xiii, 1892, p. 156.

³ Am. Jour. Physiol., vol. xii, p. 55.

⁴ Jour. Physiol., vol. viii, p. 404.; Schäfer's Text-book of Physiol., vol. ii, p. 218.

⁵ Jour. Physiol., 1892, vol. xiii, p. 93.

⁶ Pflüger's Arch., Bd. xcix, S. 245, 253.

⁷ Pflüger's Arch., Bd. xcix, S. 539; Med. News, Nov., 1903.

The difference in the results was not due to delay in the removal of the heart after death.

Vasomotors of Lungs.—T. G. Brodie and W. E. Dixon¹ assert, in contradiction of Bradford and of François-Franck, that the lungs are not provided with vasomotor fibers. They base this conclusion on the alleged fact that while adrenalin produces its typical action on peripheral vessels by stimulating vasomotor nerve-endings, it does not cause constriction of the pulmonary vessels. Their method consists in perfusing the isolated organs whose innervation is to be tested with blood under constant pressure and measuring the rate of outflow. Adrenalin, they say, while it causes a notable diminution in the outflow in the case of parts known to be well supplied with vasoconstrictor fibers, such as the limbs and intestines, has no such effect on the outflow from the lungs. [It is obvious that everything depends upon the truth of the assumption that adrenalin acts on the nerve-endings, and not, as has generally been supposed, directly on the smooth muscular tissue of the vessels. While some of the arguments by which they support their thesis deserve consideration, it cannot be admitted that they have definitely established it.] And W. W. Hamburger,² who has studied the antagonistic action of adrenalin and "peptone" on the bloodvessels, adheres to the view that adrenalin affects the muscle directly. Five to 14 days after removal of the superior cervical ganglion it still causes marked constriction of the vessels of the rabbit's conjunctiva, which is not abolished by peptone. In the normal eye the constriction produced by adrenalin is abolished by peptone, which causes distinct flushing of the conjunctiva. His inference is that peptone acts on the nerve-terminations and adrenalin on some other structure, viz., the musculature of the vessels. This conclusion is strengthened by the fact that intravenous injection of peptone immediately after an injection of adrenalin in no way interferes with the extent or duration of the rise of the pressure due to the adrenalin, which is succeeded by a fall caused by the peptone. With simultaneous injection of adrenalin and peptone the adrenalin rise is present first and is succeeded by the peptone fall. This regular sequence still persists when the relative proportions of the two substances vary within very wide limits. L. Plumier³ has confirmed these observations as regards the simultaneous action of adrenalin and peptone on the systemic circulation. In opposition to Brodie and Mellin,⁴ he finds that adrenalin causes strong vasoconstriction of the pulmonary vessels. Peptone produces no immediate fall of pressure in the pulmonary artery, or, indeed, a relatively prolonged rise. This he interprets in accordance with the view of P. Nolf⁵ that the pulmonary vessels present a greater degree of resistance to the paralyzing action of peptone than those of other parts of the body, *e.g.*, the limbs. The stimulation of the general vasomotor center, which, according to Nolf, peptone causes, is accordingly effective for a time in raising the pulmonary

¹ Jour. Physiol., vol. xxx, p. 476.

² Am. Jour. Physiol., vol. xi, p. 282.

³ Jour. Physiol. et Path. gén., July 15, 1904.

⁴ Skand. Archiv., 1904, S. 149.

⁵ Mém. de l'Acad. roy. des Sciences de Belgique, 1903, tome lxiii, p. 1; Arch. de Biol., tome xx, p. 1, and Bull. de l'Acad. roy. de Belgique, 1904, No. 2, p. 147.

Pressure, while the systemic pressure sinks. [He does not attempt to place the difference of resistance of the pulmonary and systemic arterioles on an anatomic basis. If, however, peptone acts particularly, or at any rate first among the peripheral mechanisms, upon the vasomotor nerve-endings, causing paralysis of them, Brodie and Dixon's argument, while erroneous for adrenalin, might, if applied to peptone, still lead to the conclusion that the lungs are not supplied with vasoconstrictor nerves.] Plumier,¹ however, confirms the statement of several previous observers that the annulus of Vieussens contains pulmonary vasoconstrictor fibers, and believes he has demonstrated that a fall of pressure in the pulmonary circulation can be produced reflexly through this vasomotor mechanism when the afferent fibers of the bronchoalveolar membrane are excited by irritating vapors like ammonia.

Quantity of Blood in Lesser Circulation.—Plumier² estimates that on the average the lungs of a dog contain $\frac{1}{10}$ of the total mass of the blood, the heart $\frac{1}{2}$, and heart and lungs together, $\frac{1}{4}$. He calculates the output of the ventricle in an average man as 70 gm. of blood at each systole. [This is somewhat less than the result obtained by Stewart,³ who also⁴ found the average amount of blood in the lesser circulation of dogs somewhat greater, but saw considerable variations in different experiments.]

Shock.—W. H. Howell⁵ confirms the conclusion of G. W. Crile⁶ that the fundamental cause of vascular shock is the loss of vasomotor tone and the consequent fall of blood-pressure. But while Crile believes that this loss of tone is the sole effective cause and is due to exhaustion of the vasomotor centers, Howell maintains that it is the result not of exhaustion from overactivity, but of a more or less permanent inhibition of the centers from excessive stimulation of the reflex inhibitory paths. In the rapid feeble heart-beat he sees a token of the loss of activity of the cardioinhibitory center. While he admits, with Crile, that cardiac shock is sometimes secondary to vascular shock, he asserts that it can exist independently of vascular shock as a primary result of the operation or injury. W. T. Porter⁷ has shown that in shock stimulation of the depressor, which, in conjunction with Beyer,⁸ he previously demonstrated to be connected with all the bulbar vasoconstrictor cells, can be caused to produce its normal effect on the vasoconstrictor mechanism. This is also in favor of the view that in shock the vasoconstrictor neurons are not exhausted. That the afferent portion of the vasoconstrictor mechanism, and, still more, the efferent portion, are remarkably resistant to fatigue, has been illustrated by the observations of R. Schinckel.⁹

¹ Arch. internat. de Physiol., vol. i, p. 35.

² Ibid., p. 176.

³ Jour. Physiol., 1897, vol. xxii, p. 159.

⁴ Proc. Am. Physiol. Soc., Dec. 27, 1895; Science, vol. iii, p. 112.

⁵ Soc. Exp. Biol. and Med., Feb. 17, 1904.

⁶ Surgical Shock, Philadelphia, 1899; and Blood-pressure in Surgery, Philadelphia and London, 1903.

⁷ Proc. Boston Soc. Med. Sci., Oct. 20, 1903; Boston M 1903.

⁸ Am. Jour. Physiol., vol. iv, p. 283.

⁹ Ann. de la Soc. de Méd. de Gand, 1903, No. 3.

Cerebral Circulation.—A. D'Ormea¹ describes the effect of various essences commonly used in medicine and for flavoring food (aniseed, lemon, mint, cinnamon, camphor, etc.) on the cerebral circulation in dogs. Like absinthe, which was previously investigated by Cavazzani, although in less degree, they all cause a marked fall of blood-pressure in the circle of Willis, which is independent of changes in the systemic circulation, and a rise of intracranial pressure. He suggests that they act on local vasomotor mechanisms in the brain. [The experiments may be profitably compared with those of Shields² on the influence of odors on the cerebral circulation.]

Retinal Bloodvessels.—R. H. Kahn³ states that an increase of arterial pressure caused by suprarenal extract, dyspnea, etc., occasions passive dilation of the retinal vessels, preceded by a transient active constriction of the arteries. Stimulation of the cephalic end of the cervical sympathetic shows the presence in it of vasoconstrictors for the retinal arteries in the rabbit. [This confirms the observations of all previous writers.] But no evidence of vasodilators could be obtained. This latter fact is confirmed (for the cat) by E. H. Starling and E. E. Henderson,⁴ who have also determined that the intraocular pressure varies directly as the blood-pressure in the ocular vessels, rising and falling with the general arterial pressure, but not being appreciably affected by a moderate increase of pressure in the great veins. Stimulation of the cephalic end of the cervical sympathetic or of the peripheral end of the fifth nerve raises the intraocular pressure through contraction of orbital smooth muscle. In the case of the cervical sympathetic this is followed by a fall occasioned by contraction of the intraocular vessels.

RESPIRATION.

Mountain Sickness.—[Kronecker⁵ maintained that mountain sickness is caused by disturbances of the circulation, the pulmonary vessels exposed to the diminished air-pressure dilating and, thereby, producing congestion in the lesser circulation.] F. H. Bartlett⁶ endeavors to support this theory by experiments in which he caused rabbits to breathe from a bottle containing rarefied air, and observed the consequent changes in blood-pressure in the systemic arteries. He saw marked difficulty of breathing when the pressure in the bottle was reduced to the amount corresponding to an altitude of 300 meters. [But it is scarcely necessary to point out that in mountain sickness the diminution of pressure is the same in the alveoli as over the chest, and therefore the negative pressure in the thorax, on which the expansion of the lungs in inspiration depends, is not diminished or abolished, as in these experiments. There is little room for doubt that the diminished pressure of the oxygen is the main cause of mountain sickness.] In a continuous

¹ Arch. Ital. de Biol., tome xl, No. 1.

² YEAR-BOOK, 1897, p. 1167.

³ Zent. f. Physiol., Bd. xviii, June 18, 1904, S. 153.

⁴ Jour. Physiol., vol. xxxi, p. 305.

⁵ Beilage zum Konsessions-Gesuch f. Jungfraubahn, Zurich, 1894.

⁶ Am. Jour. Physiol., vol. x, p. 149.

tion of their study on **caisson illness**, reported last year,¹ L. Hill and J. J. R. Macleod² fail to find any evidence that compressed air, even at a pressure of many atmospheres, produces any mechanic effect on the circulation. The well-known toxic effects of oxygen at high pressures are again illustrated in their work. Convulsions are frequently produced in vertebrates by exposure to from 4 to 5 atmospheres of oxygen, while exposure to 6 to 25 atmospheres causes dyspnea and coma, usually without convulsions. All the animals investigated, vertebrates and invertebrates, are instantly convulsed and killed by exposure to 50 atmospheres of oxygen. G. Bullo³, following up a previous research,⁴ states that the corneal endothelium of the excised eye of the rabbit is killed as the pressure is increased, first at the center and then in more and more peripheral zones. He puts forward the [purely hypothetical] explanation that a different degree of avidity for oxygen exists in the various zones of the corneal endothelium, the peripheral cells having the greatest avidity, and being therefore least injured by the gas.

CO₂ in Diabetes.—A. P. Beddard, M. S. Pembrey, and E. J. Spriggs⁵ have extended the observations previously made by them⁶ upon the blood-gases in diabetes and diabetic coma by determining also the CO₂ pressure in the alveolar air and by attempting to estimate the CO₂ in the venous blood and urine. They believe that while in various diseases, including diabetes (with and without coma), there is a relation, although not a strictly parallel one, between the amount of CO₂ in the venous blood and the alkalinity, the diminution in the alkalinity, with a consequent diminution in the power to transport CO₂, is not directly responsible for the low proportion of CO₂ in the venous blood in diabetic coma. This low CO₂ content may be due in part to the hyperpnea (marked by increased depth of the respiratory movements) produced by stimulation of the respiratory center during the coma by other substances than CO₂. This increased ventilation causes a fall in the CO₂ pressure in the alveolar air, and, therefore, an increased elimination of that gas from the blood.

Oxygen Consumption.—A. Durig⁷ has reëxamined the question whether the consumption of oxygen is increased when more of it is offered to the organism. He totally rejects the recent statement of Rosenthal⁸ that this does take place, and reaffirms the [almost unanimously accepted] opinion that within wide limits oxygen consumption is independent of the percentage of oxygen in the respired air.

Inspiratory Fibers in the Vagus.—F. Schenck⁹ maintains, on the strength of new experiments, that in ordinary expiration the inspiratory fibers in the pulmonary branches of the vagus are not excited. On the contrary, the expiratory fibers do not quite cease to be active. But in deep expiration with marked collapse of the lungs it can be shown that

¹ YEAR-BOOK of Medicine, 1904, p. 512.

² Jour. of Hygiene, vol. iii, p. 401.

³ Jour. Physiol., vol. xxxi, p. 359.

⁴ Bull. de l'Acad. des Sci. de Belgique, 1900.

⁵ Proc. Physiol. Soc., June 18, 1904; Jour. Physiol., vol. xxxi, p. xlv.

⁶ Lancet, May 16, 1903.

⁷ Arch. f. (Anat. u.) Physiol., 1903, Supp. Bd., S. 209.

⁸ Ver. d. Berl. physiol. Ges., May 12, 1902; June 6, 1902.

⁹ Pflüger's Arch., Bd. c, S. 337.

inspiratory vagus fibers are excited. His method was to determine whether attempts at respiration made by the animal while the lungs were held in the position of expiration by the closure of the trachea have a stronger inspiratory character before than after section of the vagus.

Death by Drowning and Resuscitation.—E. A. Schäfer¹ has published for an investigating committee the results of a fresh examination of the phenomena attending death by drowning, with a critique of the common methods of resuscitation. He describes a new method of performing artificial respiration in the human subject, which he considers to possess certain advantages over the methods in common use.²

DIGESTION.

Deglutition.—P. H. Eykman³ has studied, by means of röntgen-ray pictures, the movements of the larynx and epiglottis in swallowing. In the first stage the bolus is carried backward on the dorsum of the tongue, which then comes into contact with the posterior wall of the pharynx and presses the food downward. The epiglottis aids the tongue in cutting off the cavity of the pharynx above the bolus, which is now passed down between the posterior surface of the epiglottis and the posterior wall of the pharynx. The fact that the food comes into contact with the posterior surface of the epiglottis affords an explanation of [what has long been a puzzle] the presence of taste-buds in the mucous membrane here. The larynx is elevated, and the lower portion of the epiglottis, called by him the pars laryngea, is thus caused to come into contact with the upper orifice of the larynx, occluding it completely, the vocal cords being at the same time closely approximated. The upper part [*i. e.*, the free end] of the epiglottis (pars pharyngea) projects beyond the larynx and takes no share in its closure, serving only with the tongue to complete the movable partition across the pharynx behind the bolus. In the second stage the hyoid bone, with the larynx, epiglottis, and trachea, is drawn forward, the tip of the epiglottis gliding along the posterior pharyngeal wall. The esophagus is opened. The bolus leaves the region of the tongue, which probably gives it a final downward impulse, by which the epiglottis is at the same time pressed still more closely into the orifice of the larynx. In the third stage the tongue suddenly withdraws itself from the posterior wall of the pharynx, the hyoid and larynx return to their original position, and the larynx opens again. R. H. Kahn,⁴ after a careful investigation of the reflex mechanism of swallowing, asserts that great differences exist in different animals. In the rabbit, *e. g.*, the reflex is set up by excitation of the trigeminal fibers which supply the mucous membrane anterior to the tonsils; in the dog and cat, by excitation of the glossopharyngeal fibers in the posterior wall of the pharynx; and in monkeys, by excitation of

¹ Trans. Roy. Med.-Chir. Soc., London, 1904, Supp. to vol. lxxxvi; see also Proc. Roy. Soc. Edin., 1904, xxv, p. 39.

² Trans. Roy. Med.-Chir. Soc., London, 1904, vol. lxxxvii.

³ Pflüger's Arch., Bd. xcix, S. 513. ⁴ Arch. f. Physiol., 1903, Supp. Bd., S. 386.

the trigeminal branches distributed to the mucous membrane over the tonsils.

Emptying of the Stomach.—According to the experiments of W. B. Cannon,¹ made by the röntgen-ray method previously described,² the nature as well as the consistence of the food influences the length of its sojourn in the stomach. Carbohydrate food (mixed with subnitrate of bismuth to render it opaque to the röntgen rays) passes more rapidly through the pylorus into the intestine than fatty food, and fat more rapidly than proteid. He explains this on the assumption that the pylorus is opened when free acid appears in the stomach. Since proteid combines with the hydrochloric acid, a longer interval elapses than in the case of carbohydrate before the appropriate stimulus for the opening of the sphincter is present. When the proteid food was acidified and the carbohydrate rendered alkaline before administration, the result was reversed, the proteid passing first out of the stomach. [While the facts observed are of interest and value, the explanation given does not seem easily reconcilable with other facts—*e. g.*, the observation of A. Heichelheim and M. Krämer³ that dilute HCl introduced into the stomach remains there much longer than water, the acid producing spasm of the pyloric sphincter; and those of G. Lang,⁴ who, in 150 experiments on 3 persons, investigated the influence of various food-stuffs on the secretion of gastric juice. The foods were passed into the stomach by a tube. He endeavored to eliminate any psychic influence by keeping the individuals in ignorance of the nature of the food. He found that carbohydrate caused no secretion of HCl. Fat caused delay in the evacuation of the stomach, the contents of which became strongly acid, owing to the formation of organic acids. Secretion of HCl was seen only when proteid was given. [Of course, it must be remembered that when food is administered by a stomach-tube, the reflex excitation from the mouth and pharynx of the vagus secretory fibers, which Pawlow has shown to be so important a factor in the production of gastric juice, is eliminated.]

Innervation of the Stomach.—W. P. May,⁵ following up work previously reported,⁶ confirms the commonly accepted conclusion that the vagus contains both motor and inhibitory fibers for the whole stomach. Stimulation of the vagus causes first inhibition and then augmentation of the contraction of the cardiac and pyloric sphincters, practically the same effect as on the rest of the stomach. The splanchnics, however, contrary to the common view, have no direct influence whatever, either motor or inhibitory, on the gastric musculature.

Movements of the Intestine.—R. Magnus⁷ has made a detailed study of the movements of isolated loops of intestine immersed in Locke's solution, in which they retain their vitality for a considerable time. He

¹ Proc. Am. Physiol. Soc., Am. Jour. Physiol., vol. x, p. xvii; Brit. Med. Jour., June 18, 1904.

² YEAR-BOOK, 1899, p. 957.

³ Münch. med. Woch., Feb. 23 1904.

⁴ Arch. f. klin. Med., Bd. lxxviii, S. 302; Zent. f. Physiol., Bd. xvii. ⁸

⁵ Jour. Physiol., vol. xxxi, p. 260.

⁶ YEAR-BOOK, 1903, p. 562.

⁷ Pfüger's Arch.,

brings forward evidence that the spontaneous movements of the intestine (pendulum movements and much less rapid periodic variations of tone of the whole musculature) are not elicited by afferent impressions from the mucous membrane, since they continue in unaltered intensity after removal of both mucosa and submucosa. The same is true of the local peristaltic reflex contractions. When the circular muscular coat is separated from Auerbach's plexus, the automatic movements of this coat are abolished, although the excitability of the musculature to direct stimulation is not affected. The longitudinal coat, which is still in connection with Auerbach's plexus, goes on contracting spontaneously. He concludes that the automatic movements of the intestine are not myogenic, as Bayliss and Starling believed,¹ but dependent on a nervous mechanism (Auerbach's plexus). He remarks [justly] that this is an additional support to the neurogenic theory of the automatism of the heart. A. A. Kulialko and E. J. Alexandrowitsch² confirm the claim of Magnus that his method permits the study of the intestinal movements under practically normal conditions, and apply it to the investigation of the action of various drugs upon the movements. Adrenalin causes a marked diminution of tone, with disappearance of the pendulum movements. This action is so energetic that the drug is effective even in a dilution of 1 : 1,000,000. [Langley³ previously observed that suprarenal extract produces inhibition of the stomach and intestines.] P. Botazzi⁴ observed a similar action of adrenalin on the toad's esophagus.

How the digestive tract protects itself against injury from sharp bodies has been the subject of an investigation by A. Müller,⁵ who has reexamined the observation of A. Exner⁶ that the muscularis mucosæ, by its contraction, prevents the entrance of such bodies (splinters of glass, needles, or sharp bones) into the mucous membrane by drawing it in at the point of contact. This phenomenon, according to him, is not dependent upon extrinsic nerves, as it is unaffected by section of the vagi and the solar plexus. It is due, therefore, to a local mechanism in the intestinal wall. He confirms the statement of Exner that pins introduced point foremost are turned round and guided head foremost along the alimentary canal. But the opposite also occurs, though not so frequently. B. Bienenfeld⁷ further confirms the view that the muscularis mucosæ is concerned in this remarkable defensive process by the observation that this coat is much more distinctly developed (in the stomach and upper part of the small intestine) in animals whose food is apt to contain sharp foreign bodies than in those whose food is soft.

Salivary Digestion.—S. W. Cole⁸ has reinvestigated the action of salts on the digestive power of ptyalin. He finds that the activity of

¹ YEAR-BOOK, 1900, p. 507.

² Zent. f. Physiol., Bd. xviii, July 30, 1904, S. 277.

³ YEAR-BOOK of Medicine, 1902, p. 590.

⁴ Boll. d. R. Accad. Med. di Genova, vol. xviii, 1903, No. 2; Arch. di Fisiol., vol. i, p. 325.

⁵ Pflüger's Arch., Bd. cii, S. 206.

⁷ Ibid., Bd. lxxxviii, Nos. 7 and 8.

⁶ Ibid., Bd. lxxxix, S. 253.

⁸ Jour. Physiol., Nov. 2, 1903.

dialyzed ptyalin on dialyzed starch is increased by the addition of very small amounts of acids and of the neutral salts of strong monobasic acids. The action is decreased by larger amounts of acid (0.0007 % to 0.0012 % HCl) and by neutral salts of weak acids. These facts have led him to the hypothesis that the hydrolysis of starch by ptyalin is accelerated by electronegative ions (anions) (other than hydroxyl ions) below a certain concentration, and depressed by electropositive ions (kations) and hydroxyl ions. This result is similar to that of C. H. Neilson and O. H. Brown¹ on the influence of ions upon the decomposition of hydrogen dioxid by platinum black or by a watery extract of pancreas and on the hydrolysis of butyric ether by pancreatic extract.

Gastric Juice.—R. and A. Monti² assert that in the gastric glands of the marmot the parietal cells form the HCl in very dilute solution, excreting it into the lumen of the tubule as rapidly as it is formed. During winter sleep the production of HCl stops altogether, while the chief cells continue to accumulate granules of pepsinogen.

M. Bönninger³ has observed in a dog with a gastric fistula that the introduction of fairly large quantities of NaCl always diminishes the acidity of the gastric juice. In a healthy man the same result was obtained with 7-gram doses. [This is, of course, an additional argument against the view that the HCl comes from the chlorids of the gastric contents.⁴ As regards the practical employment of NaCl for hyperacidity, it must be remembered that the salt in a certain concentration may interfere with the digestion of proteid], as it has been shown by H. R. Weis⁵ to do to some extent with tryptic digestion, although less than sulfates or Na oxalate.

Pancreatic Juice.—O. May⁶ finds that secretion continues for some time after complete cessation of the circulation through the pancreas. He concludes [as he must] that there is no direct relationship between the rate of secretion of the pancreatic juice and the extent of the blood-supply. This result is supported by the observation of J. Barcroft and E. H. Starling⁷ that the increased secretion observed under the influence of secretin is accompanied sometimes by an increase and sometimes by a diminution in the blood-flow through the gland, and that the increased consumption of oxygen which goes hand in hand with the increased secretion is also independent of changes in the blood-supply. They disclaim any idea of contending that under normal conditions a decreased blood-flow does ever accompany an increased secretion.

K. Glaessner⁸ states that the quantity of pancreatic juice daily secreted is 500 to 800 cc. He confirms the announcement of Bayliss and Starling⁹ that it contains no trypsin, but only trypsinogen.

¹ Am. Jour. Physiol., vol. x, p. 226; *ibid.*, p. 335.

² Arch. Ital. de Biol., vol. xxxix, p. 248.

³ Münch. med. Woch., Jan. 12, 1904; Med. News, Mar. 5, 1904; Intercol. Med. Jour., Mar., 1904.

⁴ YEAR-BOOK of Medicine, 1901, p. 550.

⁵ Zeit. f. physiol. Chem., Jan. 26, 1904.

⁶ Jour. Physiol., vol. xxx, p. 400.

⁷ *Ibid.*, vol. xxxi, p. 491.

⁸ Zeit. f. physiol. Chem., Bd. xl, S. 465.

⁹ YEAR-BOOK of Medicine, 1904, p. 515; Jour. Physiol., vol. xxx, p. 61.

F. A. Bainbridge¹ has endeavored to test further, in the light of Bayliss and Starling's discovery of secretin,² Pawlow's doctrine that the nature of the pancreatic juice is adapted to different food-substances, and to throw light upon the manner in which this adaptation, if it exists, is brought about. He extends to the pancreatic juice itself, formed under the influence of secretin, Weinland's³ observation that the pancreas of dogs fed for some days with food containing lactose yielded lactase, a ferment which inverts lactose, while the pancreas of dogs whose food contained no lactose yielded no lactase. Bainbridge finds no evidence that secretin takes any part in this adaptation of the pancreatic juice. Whether the secretin is obtained from a dog fed on milk or from a dog fed on biscuit, it causes the secretion of juice free from lactase, unless the animal into which it is injected has been previously fed on food containing lactose (milk, *e. g.*). He concludes that the adaptation of the pancreas to a diet containing lactose is managed by a chemic mechanism. By the action of lactose on the intestinal mucous membrane some substance is produced which plays the part of a specific chemic stimulus to the pancreas, causing it to form lactase.

ABSORPTION.

Influence of Adrenalin on Absorption.—Extending and in most respects confirming the results of A. Exner,⁴ S. J. Meltzer and J. Auer⁵ assert that the administration of adrenalin delays the absorption and also the transudation of various substances when injected subcutaneously or into serous cavities. The effects of an otherwise certainly fatal dose of strychnin can be delayed and greatly mitigated by the intravenous injection of adrenalin. Exner's statement⁶ that the intraperitoneal injection of adrenalin retards the absorption of strychnin from the stomach is explained by them as a consequence of the impairment of the gastric movements by adrenalin, which prevent the strychnin from being passed as rapidly as usual into the intestine, where alone, according to Meltzer, it is absorbed in the rabbit.

Absorption of Fat.—B. Moore⁷ has examined the question whether the synthesis of the absorbed fatty acids and soaps to neutral fat takes place under the influence of an intracellular enzyme, and where, on the way between the lumen of the intestine and the thoracic duct, the synthesis is accomplished. He states that in the intestinal mucosa the greater part of the fatty acid is already combined with glycerin as neutral fat, although considerable quantities of free fatty acid are also present. In the lymph coming directly from the mesenteric glands practically the whole of the fatty acids are in the form of neutral fat.

¹ Proc. Roy. Soc., July 8, 1903; Brit. Med. Jour., Apr. 2, 1904, p. 778.

² YEAR-BOOK of Medicine, 1903, p. 558; Jour. Physiol., vol. xxviii, p. 325.

³ Zeit. f. Biol., Bd. xxxviii; *ibid.*, Bd. xl.

⁴ Zeit. f. Heilk., 1903, Abth. Chirurgie, S. 302.

⁵ Trans. Assoc. Am. Physicians, 1904.

⁶ Arch. f. exp. Path. u. Pharm., Bd. I, S. 313.

⁷ Proc. Roy. Soc., vol. lxxii, p. 134; Zent. f. Physiol., Bd. xvii, S. 553.

Neither pancreas, intestinal mucous membrane, lymph-glands, nor the cell-free extracts of these organs have the power of synthesizing soaps and glycerin to neutral fat, as asserted by several previous investigators. This synthesis takes place in the intestinal wall only *in situ* and while the circulation is going on.

Absorption of Albumose.—P. Nolf,¹ in an extended study, has shown that the intestinal epithelium rapidly absorbs albumose. When absorbed from an acid medium, none of it seems to enter the blood: it is all retained in the mucous membrane. In alkaline or neutral solution a small portion may pass into the blood. On the other hand,² it is readily absorbed from the peritoneal cavity and passed on into the blood, producing the characteristic effects on blood-pressure which are witnessed on intravenous injection. [This is another illustration of the fact, not always sufficiently regarded in discussions of the mechanism of absorption, that the conditions of absorption in the serous spaces are and must be very different from those in the intestine.]

J. Hofbauer³ points out that, according to his histologic observations on the placenta, the chorionic villi play a part in the absorption of fat, in the interests of the fetus, comparable to that played by the villi of the intestine in extrauterine life.

METABOLISM AND DIETETICS.

Sugar-formation in the Liver.—[As to the manner in which glycogen is transformed into sugar in the liver, two opposite views are still struggling for the mastery: on the one hand, the view that the transformation is the work of an unorganized ferment; on the other, that it is due to the vital activity of the hepatic cells.] J. Seegen⁴ has attempted to show that neither of these theories is correct, but that the process is a chemic reaction independent both of ferment action and of vital activity. His main argument is that in portions of liver kept for weeks under alcohol the formation of sugar goes on unhindered, while glycogen also disappears, although not always in proportion to the amount of sugar produced. More sugar may actually be formed in the alcohol-fixed liver than in fresh liver left in the air. He still⁵ holds tenaciously to the view which, for a quarter of a century, he has defended against all comers, of the supreme importance of the proteids (and fat) for sugar-production in the body. His observations on alcohol-hardened liver he interprets in favor of his contention that proteid is transformed into sugar in the liver, one of the intermediate steps being possibly leucin. Halsey,⁶ however, has been unable to demonstrate the production of sugar from leucin, and F. Kraus,⁷ who circulated blood containing peptone through the excised liver in the hope of demonstrating a production

¹ Bull. de l'Acad. roy. de Belg., 1903, No. 12, p. 1149; *ibid.*, 1904, No. 2, p. 153.

² *Ibid.*, 1903, No. 12, p. 1129.

³ Zeit. f. physiol. Chem., Sept., 1903.

⁴ Arch. f. Physiol., 1903, S. 425; Sitz. d. Kais. Akad. d. Wiss. zu Wien, cxi, Abth. 3.

⁵ Ges. Abhandl., Berlin, 1904.

⁶ Am. Jour. Physiol., vol. x, p. 229.

⁷ Pflüger's Arch., Bd. xcvi, S. 452.

of sugar from it, obtained a negative result, after allowing for the sugar due to the transformation of glycogen. Seegen endeavors to rebut the criticism that amylolytic ferments still act in the presence of alcohol by showing that even much weaker alcohol than he used greatly lessens the amylolytic power of ptyalin and amylopsin. But L. Borchardt¹ maintains, in confirmation of previous workers, that the sugar-forming ferment of the liver is not rendered completely inactive by alcohol, and that in this, as in other respects, it behaves just like the amylolytic ferment of blood, the activity of the ferment in the liver, however, being greater than that of the ferment in the blood.

E. Cavazzani² defends once more the influence of the activity of the hepatic cells, citing new experiments in its favor, *e. g.*, those of Monier, who, dividing the liver of an animal into two parts, minced one finely and left the other intact. After a time he found more sugar and less glycogen in the portion whose cells had been injured by mincing.

Fat-formation.—C. Mavrakis³ makes the [surprising] statement that the injection of phosphorus into fresh excised liver through the portal vein causes, under aseptic conditions, the production of intense fatty degeneration in the hepatic cells in 12 to 24 hours, at body-temperature. He draws the conclusion that it must act directly upon the protoplasm, and especially upon the proteids of the cells [which is no doubt correct, whether or not his experiments are accepted].

A. Zaitschek⁴ brings forward fresh proof of the well-established fact that the composition of the body-fat, laid down under the influence of a diet containing fat of given composition, depends essentially upon the latter. Chickens fed with unskimmed milk laid on fat which approximated in composition to butter-fat, except that the volatile fatty acids of butter-fat were absent.

Alcohol.—S. P. Beebe⁵ sums up the results of the work of recent observers on the action of alcohol in connection with some experiments of his own. He finds that in most cases one of the effects of alcohol is an increase in uric acid excretion. It is a good illustration of the colossal literature of the subject that E. Abderhalden, aided by collaborators, has published⁶ a bibliography of the scientific literature on alcohol and alcoholism in 500 pages.

INTERNAL SECRETION.

The Thymus and the Sexual Organs.—[It is well known that in castrated animals the thymus is larger and persists longer than in entire animals.] J. Henderson⁷ has made a detailed investigation of the subject in 114 cattle. In bulls and unspayed heifers the normal atrophy of the thymus, which begins after the period of puberty, is greatly accelerated when the bulls have been used for breeding, and when the

¹ Pflüger's Arch., Bd. c, S. 259.

² Ver. d. Berl. physiol. Ges.; Arch. f. Physiol., 1904, S. 220.

³ Arch. f. (Anat. u.) Physiol., 1904, S. 94.

⁴ Pflüger's Arch., Bd. xcvi, S. 614.

⁶ Berlin and Vienna, 1904.

⁵ Am. Jour. Physiol., vol. xii, p. 13.

⁷ Jour. Physiol., vol. xxxi, p. 222.

heifers have been pregnant for several months. He confirms the observation of A. Calzolari¹ that in rabbits castration also delays atrophy of the thymus, and extends it to guineapigs.

D. N. Paton and A. Goodall² state that in guineapigs removal of the thymus has no influence on the growth of the animal or on the number or character of the erythrocytes, but is followed by a decrease in the number of all varieties of leukocytes, which lasts about 2 months. The injection of staphylococci and streptococci did not usually cause the marked leukocytosis in thymusless animals which it produces in normal guineapigs, and their resistance to the toxins of these cocci was reduced.

Ovary.—Breuer and Seiller³ have examined the influence of castration on the blood in young female animals (bitches). They saw a temporary diminution in the hemoglobin content and the number of erythrocytes. This diminution, in all probability, is absolute and not merely relative. They consider that their result is in favor of the view that an insufficient internal secretion of the ovaries is the cause of chlorosis. [While there are facts which indicate such a relation, we doubt whether the experiments just cited are sufficiently definite to be taken into account.]

Corpus Luteum.—L. Fraenkel,⁴ following up the conception of Born that the corpus luteum is a gland with an internal secretion whose function is connected with the implantation of the ovum and the subsequent growth of both ovum and uterus, has arrived at the important conclusions that the absence of the corpus luteum prevents impregnation; that there is no difference between the true and the false corpora lutea; that the corpus luteum when the ovum has not been fertilized brings about menstruation; that where fertilization has occurred, it prepares the uterus for the implantation of the ovum; and that it exerts a great influence on the nutrition of the uterus from puberty to menopause. He recommends "lutein," the dried extract of the corpora lutea of cows, for the treatment of suppressed menstruation and the troublesome symptoms arising from the operative production of the menopause. It has given good results.

Pituitary Body.—The statement of previous experimenters that extracts of the hypophyseal (anterior) lobe of the pituitary produce no effect on the blood-pressure is denied by W. W. Hamburger.⁵ He maintains that intravenous injection of a saline extract causes a distinct fall of pressure, accompanied usually by acceleration and weakening of the heart. A second injection immediately following the first fails to produce any change in the blood-pressure. The active depressor substance is soluble in alcohol and glycerin as well as in salt-solutions, but insoluble in ether.

Suprarenal.—R. H. Kahn⁶ confirms the statement of M. Verworn⁷ that suprarenal extract causes the disappearance of the inhibitory reflex action of the depressor upon the heart. But he rejects Verworn's interpretation of this as due to paralysis of the vagus center. Both the

¹ Arch. Ital. de Biol., vol. xxx, p. 71.

² Jour. Physiol., vol. xxxi, p. 49.

³ Arch. f. exp. Path. u. Pharm., Bd. i, S. 169.

⁴ Arch. f. Gyn., 1903, lxxviii, S. 438; Jour. Am. Med. Assoc., Sept. 12, 1903; Clin. Rev., Dec., 1903; and Canadian Pract. and Rev., Feb., 1904.

⁵ Am. Jour. Physiol., vol. xi, p. 282.

⁶ Arch. f. Physiol., 1903, S. 522.

⁷ Ibid., S. 65.

vagus center and the respiratory center, he says, are really rendered more excitable by the extract, and the reason for the disappearance of the reflex is the increased difficulty of inhibiting the heart, owing to the stimulating action of the extract on that organ.

S. J. and Clara Meltzer¹ find that subcutaneous injection or instillation into the conjunctival sac of a medium dose of adrenalin (in the rabbit) produces marked and long-lasting dilation of the pupil on the side from which the superior cervical ganglion has been previously removed, but no dilation on the normal side. They see in this an indication that the ganglion normally sends impulses to the iris, which inhibit the dilator muscle and stimulate the constrictor. W. W. Hamburger² confirms the statement that adrenalin causes dilation of the pupil, first seen and most pronounced on the side on which the ganglion has been extirpated, the other pupil sometimes remaining perfectly normal.

F. C. Busch³ has been able successfully to graft suprarenal tissue in the kidney of rabbits. Subsequent removal of the remaining suprarenal tissue was not followed by death.

Heterothyroid Grafting.—H. Cristiani,⁴ whose numerous successful experiments on the grafting of thyroid tissue from one animal to another of the same species were previously reported,⁵ has made an equally careful examination of the question whether thyroid tissue from animals of one group can permanently maintain itself when transplanted into animals of another group. His general conclusion is that this does not take place when the groups are separated by a great interval in the animal scale. The result of a graft from one class to another (*e. g.*, from amphibians to reptiles or mammals) is always negative. The same is true of grafts from one order to another (as from a tailed to a tailless amphibian, or from a fowl to a pigeon). In the case of grafts from one family to another (as from rat to rabbit or dog to cat) the results are usually bad, but occasionally grafts may be obtained which have all the attributes of the normal thyroid tissue, except the rich vascular supply which is associated with homothyroid grafts. Grafts between animals of the same family (from dog to fox, *e. g.*) often give bad results, but the rabbit and guineapig form an exceptional combination, grafts from one to the other being generally successful. Grafts between races and varieties give good results (as between fowls of different varieties, dogs of different breeds, etc.). He promises experiments on the grafting of human thyroids into monkeys. [These cannot fail to have a great practical interest in connection with the possibility of a surgical remedy for myxedema and other conditions depending on a loss of thyroid function. The question whether the pancreas of animals nearly related to man, *e. g.*, the anthropoid apes, or portions of pancreas, can be successfully grafted into human beings suffering from pancreatic diabetes is a similar problem. It is

¹ Zent. f. Physiol., Bd. xvii, p. 651; Am. Jour. Physiol., vol. xi, p. 28.

² Am. Jour. Physiol., vol. xi, p. 282.

³ Am. Jour. Physiol., vol. x, p. xix; Proc. Am. Physiol. Soc.; Proc. Soc. Exp. Biol. and Med., Dec. 16, 1903.

⁴ Jour. de Phys. et Path. gén., tome vi, p. 476.

⁵ YEAR-BOOK of Medicine, 1902, p. 591.

not impossible that occasionally human pancreas might be obtained for this purpose at a sufficiently short interval after death, *e.g.*, from persons accidentally killed or dying suddenly from rupture of a bloodvessel, etc. Similar questions arise in the case of the suprarenal capsule.]

Nervous Tissue Extracts.—S. Vincent and W. Cramer,¹ in a further communication on the depressor substances in watery extracts of nervous tissues, announce that two such substances can be separated. The effect of one of these is abolished by atropin and therefore acts by inhibiting the heart through the vagus. The other is unaffected by atropin.

URINE.

Nerves of Ureter and Bladder.—According to Lina Stern,² the splanchnics contain inhibitory, and probably also augmentor, fibers for the ureter (in the dog). CO₂ and CHCl₃ paralyze the contractions of the ureter after transient stimulation. M. Lewandowsky and P. Schultz³ report that section either of both nervi erigentes or of both hypogastrics is never followed by more than quite temporary disturbance of function of the bladder. In a few days the urine is normally passed. In bitches the same is true when both pairs of nerves are divided. So far they confirm the experiments of von Zeissl⁴; but for male dogs they cannot do so. Here section of the 4 nerves is followed by true incontinence of urine, which, they assert, has never previously been witnessed in animals. Intense tenesmus, due to paralysis of the lower part of the large intestine, was also seen.

Effect of Salts on Urinary Secretion.—[It has been known for a considerable time that intravascular injection of certain salt solutions—*e.g.*, NaCl solution—may cause glycosuria.] O. H. Brown⁵ and M. H. Fischer⁶ have observed that the glycosuria can be suppressed or lessened by CaCl₂. Brown has observed the same effect of CaCl₂ in phloridzin glycosuria and with SrCl₂, as well as CaCl₂. [In this connection the statement of Boigey,⁷ that he used Ca salts successfully in 3 cases of diabetes, acquires new interest.]

Secretion of Acid by the Kidney.—A Cushny⁸ attempts to explain the acid reaction of the urine by the presence of salts in the glomerular fluid which are capable of extensive hydrolytic dissociation, and whose kations can permeate the epithelium of the tubules, while the anions fail to do so in equal measure. He assumes that absorption takes place in the renal tubules.

ANIMAL HEAT.

Daily Curve of Body-temperature.—F. G. Benedict⁹ saw no tendency to a complete inversion of the daily curve of temperature when the

¹ Jour. Physiol., vol. xxx, p. 143.

² Thèse de l'univ. de Genève; Zent. f. Physiol., Bd. xvii, S. 567.

³ Zent. f. Physiol., Bd. xvii, S. 433. ⁴ Wien. klin. Woch., 1896.

⁵ Am. Jour. Physiol., vol. x, p. 378. ⁶ Univ. of Cal. Pub., Dec. 24, 1903, i, p. 77.

⁷ Gaz. heb. de Méd. et de Chir., Oct. 12, 1903; YEAR-BOOK of Medicine, 1904, p. 100.

⁸ Jour. Physiol., vol. xxxi, p. 189. ⁹ Am. Jour. Physiol., vol. xi, p. 145.

daily routine was inverted. He worked with an electric resistance thermometer inserted in the rectum. This permitted readings to be taken every 4 minutes without any disturbance to the observed individual. [Undoubtedly such an arrangement might sometimes be advantageously employed in practical medicine.]

The Animal Thermostat.—A. Chauveau¹ severely criticizes the suggestion of Lord Kelvin that the regulation of the temperature of the body against high external temperature may be due to processes which absorb heat. He says this idea is based on old and erroneous observations, and is entirely contradicted by all the modern experiments.

NERVOUS SYSTEM.

F. Nissl² makes a vigorous attack upon the neuron theory, which he says was lost from the moment that Apáthy demonstrated (in invertebrates) the continuity of the fibrils through several cells.

Regeneration of Nerve-fibers.—[In recent years the view that nerve-fibers after complete separation from the central nervous system can be regenerated, after having apparently been disproved, has been revived by various observers, *e. g.*, Ballance and P. Stewart,³ Bethe,⁴ and van Gehuchten.⁵] J. N. Langley and H. K. Anderson,⁶ having reëxamined the question, pronounce, although guardedly, against this (autogenetic) theory. Head and Ham⁷ also found no evidence of true regeneration, even after 249 days, in the radial nerve (in cats) after excision of a considerable length of nerve. F. W. Mott, W. D. Halliburton, and A. Edmunds⁸ likewise obtained no effect on stimulating the peripheral end of the sciatic nerve 100 to 150 days after removal of a piece 10 to 12.5 cm. long.

Cortical Areas.—A. S. F. Grünbaum and C. S. Sherrington⁹ have confirmed the results previously reported¹⁰ on the cerebral cortex of anthropoid apes by further observations on 5 chimpanzees and one orang. In addition they find that the whole surface of the island of Reil is inexcitable as regards the production of movements. The same is true of the inferior frontal convolution on both sides. They particularly explored this area for movements connected with vocalization, with a negative result, and they accordingly conclude that either no Broca "speech center" at all distantly foreshadowing the human exists in these anthropoid brains, or that the method of stimulation by induction shocks is inefficient to cause the movements of vocalization. The recovery of the power of executing movements of the hand after the removal of the hand area is not

¹ Compt. rend., tome cxxxvi, p. 792; *ibid.*, p. 847; *ibid.*, p. 852; Zent. f. Physiol., Bd. xvii, S. 391.

² Die Neuronenlehre, etc., Jena, 1903; Zent. f. Physiol., Bd. xvii, S. 396.

³ Healing of Nerves, London, 1901.

⁴ Arch. f. Psych., Bd. xxxiv, S. 1066; Allg. Anat. u. Physiol. d. Nervensystems, Leipsic, 1903, S. 182.

⁵ Bull. de l'Acad. roy. de Méd. de Belgique, 1904, p. 50.

⁶ Jour. Physiol., vol. xxxi, p. 418.

⁷ Proc. Physiol. Soc., Jan. 17, 1903; Jour. Physiol., vol. xxix.

⁸ Proc. Physiol. Soc., Mar. 19, 1904; Jour. Physiol., vol. xxxi, p. vii.; Brit. Med. Jour., May 21, 1904.

⁹ Proc. Roy. Soc., lxxii, p. 152.

¹⁰ YEAR-BOOK of Medicine, 1903, p. 573.

due to the vicarious action of the adjacent cortex of the same hemisphere constituting the remaining part of the arm area nor to the corresponding hand area of the cortex of the opposite hemisphere.

MISCELLANEOUS.

Hybridization.—J. Loeb,¹ having succeeded in fertilizing the eggs of the sea-urchin with the sperm of various species of starfish and a holothurian, has studied the conditions which facilitate or oppose fertilization. The addition of a small but definite amount of alkali to sea-water or to an artificial medium is sufficient to permit the phenomenon to occur, while at the same time it renders the fertilization of the egg of the sea-urchin with the sperm of its own species difficult or practically impossible. The addition of a definite small amount of NaHCO_3 or Na_2HPO_4 to an artificial solution, in which regeneration of amputated polyps of *Tubularia*² takes place only very slowly, markedly accelerates the regenerative process.

Physiologic Action of Substances.—A. P. Mathews³ states that a relation exists between the physiologic action of elements and their solution tension, the toxic power (for the eggs of *Fundulus heteroclitus*) being inversely proportional to the solution tension—that is to say, the elements which most easily give up their electric charges are the most poisonous. The poisonous action of any salt is inversely proportional to the sum of the solution tensions of both its ions—*i. e.*, to the decomposition tension of the salt. H. McGuigan⁴ finds a similar relation in the case of the inhibitory power of salts for the action of malt diastase on starch. [We must not, however, overlook the evidence which has been adduced—*e. g.*, by A. R. Cushny—that in many cases the physical character of the whole molecule is the determining factor in its physiologic action.]

Rheotropism.—E. P. Lyon⁵ concludes that the primary cause of orientation of fish in streams with tolerably uniform motion is a tendency on the part of the animals to swim in the direction of the apparent movement of their environment (*e. g.*, of the bottom of the stream). The current tends to carry them down-stream, and, therefore, to cause a relative opposite movement of the environment. To keep the same visual field the fish moves up-stream.

The Isolated Uterus.—E. Kurdiowski⁶ was able, by artificial circulation of Locke's solution, to keep the isolated uterus of rabbits alive for 24 to 48 hours, in one case, a gravid uterus, for 49 hours 40 minutes. In 2 cases he studied in all its details the mechanism of parturition in the isolated uterus. The contractions of the uterus depend very little on the central nervous system. Adrenalin, even in very dilute solution, acts more energetically on the uterus than the remedies which are generally considered specific, such as ergot.

Röntgen and Radium Rays.—[The effects produced on animal tissues

¹ Univ. of Cal. Pub., Nov. 9, 1903, i, p. 39; *ibid.*, Feb. 10, 1904, i, p. 83.

² *Ibid.*, April 5, 1904, i, p. 139.

³ Am. Jour. Physiol., vol. x, p. 290; xi, p. 237; Science, 1903, xvii, p. 436.

⁴ Am. Jour. Physiol., vol. x, p. 444.

⁵ Am. Jour. Physiol., vol. xii, p. 149. ⁶ Arch. internat. de Physiol., vol. i, p. 359.

by the röntgen rays and by the emanation from radium (Becquerel rays) have excited much interest among physiologists and physicists, as well as among physicians and surgeons, during the past year.] E. S. London¹ states that radium rays cause in mice, after 3 days' exposure, dermatitis, sleepiness, loss of appetite, and weakness; after 4 days, paralysis, coma, and death. Young mice confined for 4 or 5 hours in a flask, previously connected air-tight for 1½ to 2 days with a source of the radium emanation, develop, after 2 to 3 days, similar symptoms and die with well-marked hyperemia of the lungs. [This is a result which ought to be taken account of by those who, like G. Sharp,² advocate the employment of radium rays in certain affections of the lungs.] In man, London asserts [in opposition to Hardy and Anderson³] that they cause a sensation of light in consequence of the direct excitation of the retina or of fluorescence. [If we leave this possible action out of account, it is a remarkable property of the radium rays that in the case of the higher animals they may bring about such extensive changes without causing any direct stimulation of the sense organs, destroying the skin, for example, without causing pain.] This fact suggested to E. G. Willcock⁴ an attempt to determine whether any response to the rays could be obtained from protozoa and other simple forms. The interesting result was reached that of all the forms examined, only such as contained chlorophyl gave a response other than that of being injured. In *Hydra viridis*, e. g., the response was coördinated movements to escape from the rays.

The primary effect of the radium rays on the higher animals seems to be the setting-up of a process of degeneration in the affected cells, which is followed by a secondary inflammatory reaction, and in this respect the action of the radium emanation is similar to that of the röntgen rays⁵ and the ultraviolet rays of light.⁶ The nature of the change has been studied by G. Schwarz,⁷ who, working with hens' eggs, has shown that the radium rays appear to exert a peculiar effect upon lecithin, decomposing it with formation of trimethylamin. Since lecithin is a constituent of all cells and is especially abundant in eggs and in rapidly growing normal tissues and tumors, he sees in this action the explanation of the destructive effects of radium and also of röntgen rays. This result would certainly be significant if confirmed. But, unfortunately, J. Wohlgemuth,⁸ after exposing to the long-continued action of radium representatives of the 3 great groups of substances in the tissues, proteid, carbohydrate, and fat (including lecithin), found no change whatever. He denies, therefore, that radium has an elective action on lecithin, and suggests that the decomposition of that substance observed by Schwarz was due to some favoring influence of the rays upon the autolytic processes. This view receives support from the fact that

¹ Berl. klin. Woch.; Graefe's Arch., lvii, S. 342; Zent. f. Physiol., xvii, S. 776; xviii, S. 185.

² Brit. Med. Jour., Mar. 19, 1904, p. 654.

³ Proc. Roy. Soc., 1903, lxxii, p. 393.

⁴ H. Joseph and S. Prowazek, Zeit. f. all. Physiol., i, S. 142.

⁵ E. Hertel, Zeit. f. all. Physiol., iv, S. 1.

⁶ Pfüger's Arch., c, S. 532.

⁷ Berl. klin. Woch., June 27, 1904, S. 704.

⁸ Jour. Physiol., xxx, p. 449.

autolysis of a portion of tuberculous lung was markedly accelerated by exposure to radium. In this connection the observation of H. J. H. Fenton,¹ that radium bromid exerts on hydrogen dioxid a similar catalytic action to that of platinum black, is of interest.

J. Danysz² gives additional illustrations of the fact that radium rays affect young animals to a greater extent than adults. According to him, this is the key to the explanation of the greater influence which the rays have on neoplasms than on overlying skin or muscle. The action on the skin is never immediate. There is a relatively long latent period, during which no change seems to have been produced by the rays. Then some congestion appears—it may be after 8 or even 20 days. This may go on to inflammation or even deep ulceration. The nervous system is peculiarly sensitive. A tube of radium applied to the vertebral column of a guineapig in the lumbar region caused convulsions and the complete paralysis of the hind limbs.³ The action of radium on microorganisms has been studied by various observers, among others by B. A. Green.⁴

O. K. Gilman and F. H. Baetjer⁵ state that the eggs of *Amblystoma* develop abnormally under the influence of the röntgen rays. No external gills appeared on any of the embryos. The eyes and the membranous portion of the tail were poorly developed, and the mouth was distorted. Chicks developed in hens' eggs exposed to the rays also showed deformities in the occipital region and the limbs. The feathers in the older chicks were abnormally distributed in patches.

P. Jensen⁶ gives a good review of our knowledge of the action of light on the lower animals and man, touching also on the röntgen and Becquerel (radium) rays.

N-rays.—A. Charpentier⁷ has made the remarkable, and indeed startling, announcement that active muscles and nerves give off peculiar rays which increase the brightness of a fluorescent screen—a piece of paper, *e. g.*, covered with a thin film of hexagonal zincblende or calcium sulfid. The screen is excited by exposure to the ultraviolet rays, sunlight, or, best of all, magnesium light. The fluorescent light of the screen is then permitted to die away until it has reached the steady state. Not only may such screens be seen to glow more brightly in the presence of actively contracting skeletal muscles, as the muscles of the arm or foot, or the abductor and adductor pollicis, but an objective record of the increased luminosity can be taken on a photographic plate. When the screen is placed near the heart, Broca's convolution, or the spinal cord, a similar phenomenon is observed. Much skepticism has been expressed as to the reality of these effects. Among others, A. A. Campbell Swinton⁸ has failed to convince himself that the increased fluorescence is due to anything else than the heating of the screen. But H. Walsham and L. Miller⁹ confirm

¹ Proc. Camb. Phil. Soc., 12, v, p. 424.

² La Sem. méd., 1904, xxiv, No. 1.

³ See also Brit. Med. Jour., Feb. 13, 1904, p. 382.

⁴ Proc. Roy. Soc., lxxiii, p. 375; Biol. Zent., Bd. iii, S. 35.

⁵ Am. Jour. Physiol., vol. x, p. 222.

⁶ Wien. med. Woch., Nov. 28, 1903, p. 227.

⁷ Compt. rend., Jan. 4, 1904, p. 45; *ibid.*, Dec. 14, 1903, p. 1050; *ibid.*, Dec. 28, 1903, p. 1278; La Sem. méd., xxiv, Nos. 1 and 13.

⁸ Lancet, Mar. 5, 1904, p. 685.

⁹ *Ibid.*, Feb. 27, 1904.

very positively all Charpentier's statements, and state that the effects are still obtained when a solution which absorbs heat-rays, or a layer of badly conducting material, such as a thick book, is placed between the muscle and the screen. The relation of these rays to the so-called N-rays described by Blondlot,¹ and further studied by Vitoux² and others, is still under discussion. The N-rays, which are present in sunlight, in the light of Auer incandescent gas mantles, and of Nernst electric lamps, have the power of activating many substances, such as gold, silver, platinum, iron, etc., when exposed to them. The activated substances then give off the rays themselves for a time. Hammered metals, tempered steel, crystallized sulfur, and other substances are permanent sources of the rays. They pass through salt-solution, through thin sheets of gold, platinum, tin, and other metals, mica and glass, but not through pure water. Unlike the röntgen rays, they undergo polarization, refraction, and reflection. The eye itself, according to Blondlot, is a source of N-rays, and its sensitiveness to light is increased under their influence. Charpentier states that when the rays are directed upon the skull, especially in the neighborhood of the angular gyrus, a sensation of light is produced, and that changes in the pupils can be caused by directing the rays so that they must pass through the medulla oblongata or the corpora quadrigemina. He supposes, therefore, that the N-rays which exist in ordinary light take a share in producing the phenomena of vision. The story assumes a somewhat mystic character when he proceeds to state³ that when screens which contain, in addition to the phosphorescent substance, one or other of the alkaloids, are exposed to rays coming from the various organs, their luminosity is increased when the alkaloid is one which has a special action on the organ, a screen containing digitalin, *e. g.*, being brightened by rays from the heart, while a screen containing strychnin is most affected by rays from the spinal cord. [Undoubtedly, these statements require searching examination.] There are certain reasons for thinking that these physiologic rays are not identical with the physical N-rays, and there seem even to be differences between the rays given off by nerves and those given off by the heart, diaphragm, and other muscles, the rays from muscles passing easily through aluminium, those from nerves with difficulty. Walsham and Miller⁴ state that rays from a contracting muscle can be transmitted along a copper wire, and thus be caused to produce a phosphorescent effect upon a screen placed some distance away. They agree with G. Ballet,⁵ who has investigated the rays in certain affections of the nervous system, that these phenomena will be utilized in the future for the foundation of new methods of diagnosis.

¹ Nature, Feb. 18, 1904; Brit. Med. Jour., Jan. 9, 1904; Jour. Am. Med. Assoc., Feb. 6, 1904, xlii, p. 404; Electrician, Mar. 11, 1904.

² La Presse méd., 1904, No. 6; Jour. Am. Med. Assoc., Mar. 12, 1904, p. 742.

³ Jour. Am. Med. Assoc., Apr. 30, 1904, p. 1189.

⁴ Loc. cit.

⁵ La Presse méd., i, No. 22; Lancet, Mar. 12, 1904.

LEGAL MEDICINE.

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GENERAL SUMMARY.

THE only real progress which has been made in medicolegal medicine in the last year is the creation of several important state laws. The laws of New Mexico relate to the establishment of sanitariums for tuberculosis. A somewhat similar law has been passed by Pennsylvania, providing for the establishment of a sanitarium for consumptives on the State Forestry Reservation in Franklin County. Important laws of New York and North Dakota have been passed regulating the distribution of samples of medicine to children. Laws have been passed in Pennsylvania forbidding the sale of cocaine unless prescribed by a registered physician, dentist, or veterinarian. An excellent and important law was also passed in this state, by which inebriates or drug habitués may be committed to asylums for restraint, care, and treatment. The literature contains an interesting history of the ancient manner of dealing with malpractice. The legal aspect of medicine in India contains some novel features, and it is interesting to note that rupture of the spleen plays a very important part in violent deaths in that country. A case of double consciousness and one of automatic wanderings are cited. Those especially interested in this subject will find a recent publication by Sidis and Goodhart, entitled "Multiple Personalities," very interesting and instructive. In this volume a case of double consciousness is carefully studied and fully described. Many cases of interest illustrating the progress in medicolegal medicine, and establishing in many instances important precedents, will be found in the literature. It is gratifying to note that Pennsylvania refused an application for a charter made by the First Church of Christ, Scientist, a Christian Science body. An analysis of the literature upon crime and suicide shows a large increase in both. Carbolic acid seems to be the favorite method of self-destruction. Attention is called to the fact that only 7 % of the 154 cases admitted to the Massachusetts State Asylum for Insane Criminals in the last 2 years did not give a history of alcoholism. Wherry seems to have struck the nail on the head when he claims that responsibility for crime depends upon whether or not the criminal act is directly the result of the alleged insanity. Overlying is practised to an extensive degree in England. In 10 years there were 15,009 examples of this crime in England and Wales alone. The literature contains an

illustration of a very unusual attempt at suicide in a woman, who took, with suicidal intent, a large amount of a culture of typhoid bacilli. She promptly developed typhoid fever, but recovered. In the literature of toxicology several novel forms of poisoning are related. For example, a number of patients displayed the symptoms of mercuric poisoning as a result of inhaling vaporized mercury. Two cases of veronal poisoning are on record. [The writer recently saw in his practice 2 cases in which, after the administration of veronal, the patients developed skin-eruptions, in one consisting of a general erythematous rash without subjective symptoms, in the second a papular rash appearing on the chest, the bends of the elbows, armpits, and groins, which was persistently itchy. In both cases the eruption disappeared promptly after the withdrawal of the veronal.] The report of the epidemic of arsenical poisoning in England in 1900, made by the Royal Commission, deserves especial study.

MENTAL CONDITIONS.

The Court of Appeals of New York State¹ expressed an opinion upon the **legal status of weakmindedness** in a case in which an inquiry was made into the responsibility of E. P. Clark, who was incompetent to take care of his affairs on account of weakness of the mind. The Court of Appeals held that while a person may be of weak mind, and for that reason easily influenced by others to such an extent that he should not be permitted to manage his own affairs, yet he would not necessarily be of unsound mind. "The Courts of Chancery in England and in this State regard unsoundness of mind as meaning mental incapacity, and under the provision of our present status, unsoundness of mind must amount to that; that it is regarded as equivalent to a condition of lunacy."

Albert Wilson² described a case of **double consciousness** occurring in a girl of 12½, who, after an attack of influenza complicated by meningitis, in the fourth week of which attack she suffered from convulsions which disappeared in the fifth week, developed a paralysis of the legs and cataplexy in the sixth week. It was at this time that the double consciousness developed. Her talk was infantile, and she misnamed words and letters. During the first attack her conduct differed very greatly from the normal. She was noisy and very familiar in her manner. At the beginning of her disease the abnormal states lasted from a few minutes to an hour, but later the normal periods grew shorter and shorter until she finally became apparently wholly abnormal. The abnormal stages were then constant—that is, each stage appeared and disappeared at stated intervals. Each substage was characteristic of itself—that is to say, when any particular substage made its appearance, the characteristic symptoms of this substage were always present. Its memory was limited only to previous similar stages.

W. S. Coleman³ reports a case of **automatic wandering** in a man of

¹ Boston M. and S. Jour., June 18, 1903.

² Jour. of Ment. Sci., 1903, No. 207, p. 640.

³ Lancet, Aug. 29, 1903, p. 593.

37. He had suffered 2 prolonged attacks and several short ones. The first prolonged attack lasted 30 hours and came and went suddenly. He awoke in a different town and found he had spent several shillings, and as he was not hungry, he probably had bought himself food. He was able to return to work on the following morning. The second prolonged attack lasted $5\frac{1}{2}$ days. In this attack he awoke in a town where he had never been before. The heels of his boots were worn down, the soles of his feet were blistered, and he suffered from violent headache. He was not hungry and discovered that he had spent several shillings. Several short attacks had lasted for a few minutes to half an hour. Coleman could discover nothing abnormal in his nervous system, and there was no history of any attacks of petit mal. Coleman believed that there was a strong epileptic tendency in his case, and he concludes that the condition was similar to the attacks of automatism described by Charcot and others. He cites 2 other cases reported previously in the St. Thomas Hospital Reports. He calls attention to the medicolegal importance of these cases.

DEATH AND THE DEAD BODY.

Fritz Reuter¹ quite fully reviewed the literature relating to the **anatomic conditions found in death from strangulation**. In summing up his conclusions he stated that strangulation is best defined as a condition in which the respiration is mechanically interfered with, while the so-called general conditions, indicating suffocation, such as cyanosis of the face, ecchymoses of the eyelids and of the connective tissues, fluid dark blood, hyperemia of the internal organs, particularly the lungs, and ecchymoses in the serous membranes, with finally anemia and contraction of the kidneys, are all valuable in supporting the diagnosis of strangulation, they are in no way pathognomonic. An absolute diagnosis of strangulation can be determined only by demonstrating the cause of the strangulation.

Negresco² cited a case illustrating an **unusual form of death** in a child of 3, who died in convulsions in the arms of her nurse. The previous health of the child had been excellent in every way. Suspicion fell upon the nurse, and it was not until investigation was made that the real cause of death was discovered. The autopsy showed the presence of a lumbricoid worm obstructing the trachea, and resulting in the suffocation of the child. The worm was dead.

F. Reuter³ found anemia of the spleen in cases of **death from suffocation** in man and in experiments on animals. In 57.5 % of cases of drowning and a few cases of suffocation from other causes this condition was present. Although anemia of the spleen has no particular significance, it is a valuable aid in the diagnosis of suffocation.

Maurice d'Halluin⁴ claimed that when occasion arises to **decide**

¹ Wien. med. Woch., July 11, 1903, p. 1334.

² Jour. de Méd. de Paris, Jan. 21, 1904.

³ Wien. med. Woch., May 28, 1904.

⁴ Jour. de Méd. de Paris, May 15, 1904, p. 201.

whether an infant has been born dead or alive, and in clandestine accouchment, with suspicion of infanticide, that the pulmonary docimasia based upon the fact of the great density of the lung in the fetal state is of great importance. Pulmonary insufflation may be a source of error, but in medicolegal medicine this can be considered practically *nil* for 2 reasons: first, that these procedures presuppose the presence of a physician, when, of course, the delivery would not be clandestine, and, second, in the case in which the mother should practise artificial respiration herself it is possible to discover the fact—(1) By the presence of subpleural emphysema; (2) the presence of areas still retaining the fetal state; (3) the anemia of the lungs; (4) the absence of fine air-bubbles when the lung is expressed; (5) the sinking of the lung in water after compression; (6) the presence of air in the stomach. In conclusion, he called attention to—(1) the value of pulmonary emphysema as a sign that artificial respiration has been practised; (2) the value of the presence or absence of air in the internal ear as a sign of spontaneous respiration or not; (3) the efficacy of artificial respiration and its effect especially upon the pulmonary insufflation.

E. Rippe¹ reported the **effect of lightning** upon 23 troopers. One man was killed and 7 required hospital treatment. Those who were stunned could not recall the lightning-flash nor the thunder. Functional nervous troubles, paresthesia, cerebral and spinal troubles, numbness and paresis of the extremities, and hyperesthesia were the symptoms exhibited. A number of the cases were peculiarly marked.

Solomon Solis Cohen² asks the question: **Can our procedures for the judicial determination of the cause of death be bettered?** Cohen does not believe that the present method for determining the cause of death now in use in the courts of Pennsylvania, as well as in other courts of the United States, is a sure one, or that a jury can be expected to arrive at an intelligent conclusion from the evidence given in a case possessing any degree of obscurity. The cause of death in a given instance can be based upon—(1) Relevant circumstances concerning the death; (2) the manner of death; and (3) the results of the postmortem examination. The tests of accuracy to be applied to evidence upon the cause of death are to be found in the manner in which the examinations are made. He suggests that these examinations may be made conjointly by experts for the state, and any differences should be decided by a third expert, who should be previously agreed upon by both sides. In the absence of conjoint examinations only portions of the material should be used by the experts for the prosecution, while a part should be reserved at each critical stage for the use of experts for the defendant when such shall have been appointed. He further believes that experts should be required to preserve and present in court the results of their investigations, whether they be positive or negative. The only way that an expert can be safely qualified is to have his testimony judged by an expert jury. A jury of experts, composed preferably of 5 or 7, should sit to decide the cause of

¹ St. Petersburg. med. Woch., 1904, No. 2, p. 11.

² Amer. Med., 1904, p. 54.

death. The evidence should be submitted to this jury in open court, and the lawyers should be privileged to cross-examine.

In the case of *Meyer vs. The Supreme Lodge, Knights of Pythias*,¹ an effort was made by the former to **recover benefits when the insured had committed suicide**, which, according to the terms of the certificate, canceled the obligation of the insuring company. The defense called 3 physicians who had attended the insured to testify as to the cause of death. There was no evidence, however, that the insured authorized the attendance of these physicians, although there is no doubt that they attended him in a professional capacity. The question then arose whether their evidence could be offered under the New York Code of Civil Procedure, which forbids physicians disclosing information obtained while attending in professional capacity which was necessary for them to act in that capacity. A second section of the law applies to the examinations of physicians: "Unless the provisions thereof are expressly waived on the trial or examination . . . by the patient. . . . But a physician . . . may on a trial or examination, disclose any information as to the mental or physical condition of a patient who is deceased, which he acquired in attending such patients professionally, except confidential communications and such facts as would tend to disgrace the memory of the patient, when the provisions of Section 834 have been expressly waived on such trial or examination by the personal representatives of the deceased patient." The court did not permit the testimony of these physicians on the ground that a declaration on the part of the insured that he had attempted suicide would tend to disgrace his memory.

The Second Appellate Division of the Supreme Court of New York,² in the case of *Niskern vs. United Brotherhood of Carpenters and Joiners*, decided that the **rupture of a bloodvessel while lifting cannot be considered an accidental injury**, under the interpretation of the Brotherhood's constitution.

In the case of *Garcelon vs. Commercial Travelers' Eastern Accident Association*,³ the Supreme Court of Massachusetts considered the **amputation of an arm a little below the elbow as meaning a loss of arm** in the common acceptance of these words, and when a policy merely specifies "the loss of an arm," and in which there is no mention whether the loss is by amputation above or below the elbow-joint, that amputation below the elbow may be construed as meaning the "loss of an arm."

The Supreme Court of Appeals of West Virginia, in the case of *Tompkins vs. Pacific Mutual Life Insurance Co.*,⁴ held that the clause in the policy reading: "any **medical advisers** of the Company shall be allowed **to examine the person or body of the insured** in the case of death in such manner and at such time as may be required," concerns only the right to examine the injured person, and that this also applies to the authority of the medical adviser, who is the company's agent. It fur-

¹ Jour. Am. Med. Assoc., July 4, 1903.

² Jour. Am. Med. Assoc., May 21, 1904.

³ Jour. Am. Med. Assoc., Nov., 1903.

⁴ Jour. Am. Med. Assoc., Aug. 1, 1903.

ther extends the right to make the examination "in such a manner and at such times" as the agent may require. The physician has no right to treat the patient, nor is the insured required to submit himself to treatment at his hands. If the physician replaces a plaster cast improperly after examining a sprained ankle and injury results therefrom, he is guilty of negligence and his principal must answer in damages.

The Supreme Court of Missouri, Division No. 1,¹ decided in favor of the suing party in the case of *Lorsch vs. Casualty Company*, in which a mother sued to recover against the insurance company for the death of a son insured in the company. A clause in the **policy stated that no postmortem examination** should be made without first notifying the company, and without the presence of a medical adviser appointed by the company. The attending physician made a postmortem examination with the consent of the mother, and after the autopsy had been completed, the mother handed the physician the insurance policy. The physician then discovering for the first time the clause relating to the postmortem, went immediately to the office of the insurance company and offered to reexamine the body in the presence of their medical adviser. The company, however, expressed no desire to have this done, and the day following the body was buried. The mother testified that she did not know the meaning of the word "postmortem," and did not know what the physicians were doing, but the attending physician, after reading the clause relating to postmortem, went immediately to the company's office, informed them of what he had done, and offered to make another examination. Therefore there was no disadvantage shown the company, and there was no suggestion that a reexamination of the body would not have revealed to the company's medical attendant everything that was discovered at the first examination.

The Supreme Court of Texas, in the *Maryland Casualty Co. vs. Hudgins*,² held that the company was **not liable for death resulting from eating unsound oysters**. It thus took a different view from that held by the Court of Civic Appeals, reported in the *American Medical Journal*, May 16, 1903. It was claimed that though eating oysters is not accidental, that eating spoiled oysters is accidental, because the insured did not intend to eat oysters that were not good. The Supreme Court did not admit this distinction.

MEDICAL JURISPRUDENCE, ETC.

The Supreme Court of Louisiana³ held, in the case of *State vs. Brown* that **dying declarations** still held their same character even if the patient making them survived.

The Supreme Court of North Dakota, in the case of *Brown vs. Chicago, Milwaukee, and St. Paul Railroad Company*,⁴ in which the suing party

¹ Jour. Am. Med. Assoc., Sept. 26, 1903.

² Jour. Am. Med. Assoc., Jan. 2, 1904.

³ Jour. Am. Med. Assoc., Mar. 12, 1904.

⁴ Jour. Am. Med. Assoc., Dec., 1903.

alleged a permanent injury to the uterus and bladder and fracture of the hip-bone the result of a railroad accident, reversed the decision of the Trial Court, which assumed that it **had not the power to enforce the examination of the person of the suing party** by a physician. The Trial Court further concluded that even although it was in error on this point, it would decline to make an order for the examination by reason of the fact that it would be an ordeal to which the woman should not be subjected. The Supreme Court held, however, that in cases of personal injuries which were alleged to be permanent the Trial Court has the power to demand examination of the injured party when the exigencies of the case demand it. The courts of Massachusetts, Texas, and Delaware, as well as the Supreme Court of the United States, deny the power to require examination.

The Court of Civil Appeals of Texas, in Galveston, Harrisburg, and San Antonio Railroad Company *vs.* Hennigan,¹ held that while a **master** is not bound to furnish medical or surgical treatment for his servants, **if he undertakes to do so, the law holds him responsible for a reasonable care** in engaging the services of competent and skilful medical attendants. If he fails to do so, and the physician employed is unskilful and incompetent and the servant receives injuries through such incompetency, the master is held responsible by law.

The Supreme Court of Kansas, in Atchison, Topeka, and Santa Fe Railroad Company *vs.* Parry,² held that it is the **duty of railroad companies to provide proper medical care** and provision for any one becoming sick or unconscious while a passenger, and that it is a question for the jury to decide whether or not such care has been exercised.

The Supreme Court of New York, in the case of *State vs. Herring*,³ held that an **osteopath did not violate the provision of the Act of May 22, 1904, Section 8, forbidding the application of any drug**, other agency, or application by an unlicensed person. "Other agency or application" refers to the means which are other than the natural faculties of the actor—that is, some extraneous substance.

The Supreme Judicial Court of Massachusetts,⁴ in the case of *King vs. The Forbes Lithograph Mfg. Company*, decided that the department **superintendent was not authorized as agent for the company to make a contract with a physician** to treat one of the company's employees, notwithstanding the fact that he was privileged to engage and discharge workmen. The case is different when an agent of a railroad company employs a physician to attend an employee of the company in emergency cases.

The Fourth Appellate Division of the Supreme Court of New York, in *Button vs. Weaver*,⁵ stated that **as long as the marriage relation continues the husband is liable for the actual necessities of his wife**, even although they are living apart.

Supreme Court of Washington, in the case of *Sanders vs. Stimson Mill Co.*,⁶ decided that **maritime law entitles a seaman to medical care at**

¹ Jour. Am. Med. Assoc., Dec. 26, 1903.

² Jour. Am. Med. Assoc., Oct. 17, 1903. ³ Jour. Am. Med. Assoc., Mar. 5, 1904.

⁴ Jour. Am. Med. Assoc., Aug. 1, 1903. ⁵ Jour. Am. Med. Assoc., Dec. 26, 1903.

⁶ Jour. Am. Med. Assoc., Nov. 28, 1903.

the expense of the ship, whether the condition were the result of negligence on the part of the owners of the ship or due to disease or accident. This responsibility, however, does not go beyond expenses incurred in recovery.

The Supreme Court of Minnesota, in the case of *Henslin vs. Wheaton*,¹ in which an action was brought against a physician and surgeon for **negligence and unskilfulness in the application of the x-ray**, which was used for the purpose of locating a foreign body in the lung, held that the ruling of liability is that which is applied in other actions for malpractice, namely: that the physician shall exercise that degree of reasonable care and skill usually given by physicians and surgeons in good standing. The suing party called as expert witness one who was not a physician and surgeon, and the defendant raised the objection that he was not competent to testify against him under the ruling announced in the case of *Martin vs. Courtney*, 75 Minn. 255, which held in actions for malpractice when unskilfulness in treatment was charged, that the physician had the right to be judged by physicians of the same school. But the Supreme Court held that the trial court erred in this opinion, stating that there was no reason why the application of the x-ray should not be explained by any person who understood it.

The Supreme Court of Pennsylvania² confirmed the decision of the Master, who **refused to approve a charter applied for by the First Church of Christ, Scientist**, the purposes of which were to "establish and maintain a place for the support of public worship, and to preach the gospel according to the doctrine of Christ Jesus and the Christian Science text-book of 'Science and Health with a Key to the Scriptures,' by Mary Baker G. Eddy." The court adopted the conclusions of the Master that the practice of the art of curing diseases as set forth by Mrs. Eddy's book is injurious to the community, because it is in opposition to the methods prescribed by the laws of Pennsylvania governing the treatment of disease.

The Supreme Court of Georgia, in the case of *Owens vs. Macon and Birmingham Railroad Co.*,³ held that **a railroad cannot refuse to transport an insane person**, but has the right to insist that the patient shall be properly attended, safely guarded, and securely restrained. Further, if the patient is violent, the company is not required to transport him in the same cars with other travelers. In such cases, when it is essential to transport a violent and noisy patient, the company is entitled to seasonable notice so that it may make proper arrangements.

The Branch Appellate Court of the First District of Illinois, in the *Lake Street Elevated Railroad Co. vs. Gormley*,⁴ held that the **marring of the personal appearance** and the humiliation resulting from constant contemplation of such disfigurement cannot enter into the estimation of pecuniary damages in suits sustained for receiving alleged injuries.

Judge Haight, of the Court of Appeals of New York, sustained the de-

¹ Jour. Am. Med. Assoc., Feb. 13, 1904.

² Jour. Am. Med. Assoc., Nov., 1903.

³ Jour. Am. Med. Assoc., Feb. 6, 1904.

⁴ Jour. Am. Med. Assoc., Jan. 2, 1904.

cision of the Trial Court in the case of J. Luther Pierson, who was convicted of criminal neglect because he permitted only a **faith-cure healer** to care for his child who was suffering from bronchopneumonia. Judge Haight defines "medical attendance" as attendance by an authorized medical practitioner.

The Court of Civil Appeals of Kansas City, Mo., in the case of *Evans vs. Marion Mining Company*,¹ held that the **company's president and general manager had the authority to provide medical attendance** for an employee hurt through the negligence of the company while performing his work. It was the duty of the president and general manager to see that the injuries were not made worse by lack of medical attendance.

In the case of *Brendon vs. Travelers' and Accident Insurance Company of New York*,² the suing party, a physician, while holding on to a strap in a crowded street-car, was swung violently around as the car turned a corner, twisting and straining his knee. At the time of the accident he felt some pain, but was transferred to another car later on and returned to his home. The next morning there were pain and swelling, but he made a visit to a nearby patient, and then returned home, where he remained. Two days later he went to bed and called a physician, who put his knee in splints. The Accident Company **attempted to evade the payment of the claim because the physician was not immediately disabled**, but the First Appellate Division of the Supreme Court of New York held that he was "immediately, continuously, and wholly disabled" from performing the duties of his profession within the fair intent and meaning of the insurance policy, and that because his sense of duty led him to make a visit to a patient while crippled and really disabled, was not sufficient to show that he was not wholly and continuously disabled. If the policy did not cover such a condition, it was useless, and to permit an insurance company to escape payment under such circumstances would be to sanction the perpetration of a fraud.

The Supreme Court of Nebraska, in the case of *Bothwell vs. State*,³ held that **moral insanity** is not recognized as a criminal defense in Nebraska, and that the **test of responsibility** is the capacity to understand the nature of the act which was alleged to be criminal, and the capacity to distinguish between right and wrong as pertaining to the alleged criminal act. He who recognizes what is right and what is wrong chooses at his peril the wrong, and shuns the right, and he cannot offer weakness of will as an excuse for yielding to a vicious impulse.

The Appellate Term of the Supreme Court of New York, in the case of *Hazard vs. Potts*,⁴ in which the wife was sued for a bill for medical services rendered her husband and family, held that the **liability for these services was presumptively and primarily on the husband**, unless the wife expressly agreed to be responsible. It was, therefore, incumbent upon the suing party to prove that she undertook the liability.

¹ Jour. Am. Med. Assoc., Sept. 5, 1903.

² Jour. Am. Med. Assoc., Sept. 5, 1903.

³ Jour. Am. Med. Assoc., June 25, 1904.

⁴ Jour. Am. Med. Assoc., July 25, 1903.

The Supreme Court of Kansas, in the case of *Steiner vs. Liggett*,¹ supported the city ordinance which imposed a tax of \$5 a day on magnetic, psychic, and other natural healers.

In the case of *Having vs. the City of Covington*² it was alleged by the suing party that he was **taken to a pest-house against his will when suffering from smallpox**, and that while there received improper care because the roof had broken and the sides of the house were open, permitting the rain, snow, and ice to come in on him; that the place was filthy, unhealthy, and damp, and that the bed-covering and the place where he was kept were unfit for occupancy. On account of these conditions he suffered both mental and physical pain and anguish, by means of which the ravages of the disease were increased. The Court of Appeals of Kentucky stated the general underlying principle of the government of municipal corporations, which provided that the city is not responsible for the malfeasance of its employees and officers. The court claimed that the city was acting for the preservation of public health and in a governmental capacity in the law of the city government. This conclusion is supported by the state authorities and the judgment in favor of the city was confirmed.

W. J. Buchanan³ presented certain **aspects of medical jurisprudence in India**. Poisoning, he states, is a very common crime in the East, arsenic being used for homicides, opium for infanticides and suicides, and datura for drugging with intent to rob. Within the last 5 years the cocain habit has become so prevalent as to necessitate measures for the control of the sale of this drug. A distinguishing sign of the cocain eater is an ebony blackness of the posterior aspect of the teeth. When the drug was immediately stopped in 100 cases, the abstinence symptoms were insignificant. Camphor-chewing is not uncommon among native school-girls. Rupture of the spleen is extremely common in India. In the majority of cases in which a European is accused of causing the death of a native by a blow or kick, rupture of the spleen is almost invariably present. The average weight of a native of Bengal is 110 pounds, while the average weight of the spleen is 10 ounces. Buchanan has, however, seen a spleen which weighed 64 ounces. Nearly two-thirds of those suffering from this condition are adults. It is caused usually by blows from sticks. In 304 cases 102 were due to blows from sticks, 62 to blows of the fists or kicks, 22 to falls, 2 to pressure on the body, which is a form of torture, 23 the result of murderous assaults, and 20 from being run over or from having a heavy weight fall upon the body.

JUDGMENTS AWARDED AND LEGAL DECISIONS ON MEDICAL SUBJECTS.

The Supreme Court of Minnesota, in the case of *Vant Hul vs. Great Northern Railway Company*,⁴ did not think that \$14,400 was an exces-

¹ Jour. Am. Med. Assoc., Aug. 1, 1903.

² Jour. Am. Med. Assoc., Mar. 26, 1904.

³ Dublin Jour. of Med. Sci., Feb. 1, 1904, p. 81.

⁴ Jour. Am. Med. Assoc., Nov. 28, 1903.

sive amount to be paid to a young man of 18 who, by reason of an injury, lost the sight of one eye and suffered an impairment of vision in the other eye to the extent of about $\frac{1}{16}$, with the probability that he would eventually become totally blind.

The Court of Civic Appeals of Texas, in the case of the International and Great Northern Railroad Company *vs.* Moynahan,¹ held that a verdict for \$20,000 damages was not excessive in the case of an engineer of 38, earning \$140 to \$150 a month, by reason of the fact that he suffered great agony for many months, finally became a physical wreck, and could not move his head or preserve balance naturally as a result of his spinal injuries, was constantly in pain, and totally incapacitated for work, with one side paralyzed and a tendency to grow worse.

The Supreme Court of Missouri, in the case of Longan *vs.* Weltmer,² affirmed the judgment for \$7500 damages for injuries sustained by the plaintiff through the carelessness and unskilful treatment of one of the employees of the magnetic healers.

The Court of Civic Appeals of Texas, in Houston and Texas Central Railroad Co. *vs.* Bulger,³ did not think that a verdict of \$4000 damages was excessive in the case of a boy of 13 who was scalded on both legs, from which accident he suffered intense pain for over 3 months, and where the burns did not heal until 6 months after the accident. The skin was destroyed on the right leg and in patches on the left, and in healing the scars interfered with the circulation of the blood to such an extent that varicose veins would probably ensue.

The Court of Civil Appeals of Texas, in Texas and Fort Smith Railroad Company *vs.* Hartnett,⁴ held that \$10,000 damages would fully compensate a locomotive engineer for the loss of his left hand, when the jury had previously allowed \$15,000. The court stated that they were unable to find any cases in which damages were of the amount allowed by the jury.

The Appellate Court of Illinois for the First District, in City of Chicago *vs.* Gillette,⁵ sustained the judgment of \$10,000 damages where a man of 44, earning \$70 to \$75 a month, developed a rupture the result of falling through a defective sidewalk. The rupture was 22 inches in circumference; the patient suffered day and night for 2½ years; the rupture required a leather bag or pouch, was irreducible, incapacitated him for work, and would probably grow worse.

The United States District Court⁶ held that \$4000 damages was a reasonable sum to be paid to a passenger who, in disembarking, sprained her ankle and fractured the coccyx in falling between the boat and dock. Medical experts testified that the injuries were all permanent in character, that she would suffer all her life, and that there was a tendency for her to become an invalid and a nervous wreck.

¹ Jour. Am. Med. Assoc., Feb. 6, 1904.

² Jour. Am. Med. Assoc., May 7, 1904.

³ Jour. Am. Med. Assoc., June 11, 1904.

⁴ Jour. Am. Med. Assoc., Oct. 3, 1903.

⁵ Jour. Am. Med. Assoc., Jan. 2, 1904.

⁶ Jour. Am. Med. Assoc., Dec. 26, 1903.

CRIME AND SUICIDE.

According to the Chicago Tribune, in 1903¹ there were 8976 crimes which resulted in death from violence, an increase over 1902, when there were 8834. Of this number, 406 were committed by thugs and holdup-men, which was twice as many as in 1902, showing an increase in lawlessness. There were 8597 cases of suicide, these figures showing a steady increase since 1899. Poisoning and shooting are the favorite methods. In 1903 there were 123 penal executions, against 144 in 1892, 188 in 1891, and 110 in 1900. There were 63 white and 60 colored executions, of which 77 were in the south and 46 in the north. In Missouri, New York, and Alabama there were 11 hangings each; in Virginia, 10; Georgia, 9; and Pennsylvania, 8. There were 104 lynchings, against 96 in 1902. Of this number 86 were negroes, 17 were white men, and 1 was a Chinaman. Of this number 102 were men and 2 were women, 92 being in the south and 12 in the north. The principal crimes alleged were murder in 47 and criminal assault in 20. There were 11, 12, 14, and 18 respectively in Arkansas, Georgia, Louisiana, and Mississippi.

A. T. Bristow² called attention to the **alarming increase in the number of suicides due to taking carbolic acid**. In 5 years the number of deaths from carbolic-acid poisoning in Brooklyn has risen from 262 to 315. Of 1433 deaths in 5 years due to carbolic acid, 1236 were suicides. Bristow called attention to the urgency of passing laws to regulate the sale of this drug.

Strauch³ classified stab-wounds as follows: Those from before backward, in which the weapon may go through—(1) The intervertebral disks; (2) through the body of the vertebrae, destroying them; (3) through the intervertebral foramina; (4) through the transverse foramen of one spine through into the intervertebral foramen between this and that of the one below, and then finally into the spinal canal. Stab-wounds from below upward, in which the weapon may pass—(1) Through the intercostal spaces; (2) between the spinous processes; (3) through the trigonum arteriæ vertebralis. The size of the wound depends upon the sex, age, stature, and bony structure. The size of the wound between the vertebrae differs in different individuals of the same age, and on the right and left sides of the same individual. It is rare that stab-wounds of the anterior cervical region into the spinal canal are associated with injury to the large vessels of the neck. In these last injuries it is possible—(1) Not to injure the membranes of the cord; (2) to involve the membranes; (3) to penetrate the membranes and injure the cord; (4) to injure the membranes, the roots, or root-fibers of the same side, but not to affect the spinal cord; (5) to injure the membranes and the roots of the other side, but not to involve the spinal cord. In neck wounds from before in the direction of the spinal canal it is possible for the weapon to glide along the anterior side of the spinal column on the prevertebral

¹ Amer. Med., Feb. 20, 1904.

² N. Y. and Phila. Med. Jour., Jan. 30, 1904, p. 195.

³ Wien. med. Woch., Nov. 7, 1903, p. 2131.

fascia, and to injure a nerve on the opposite side. The spinal cord becomes frequently injured in stab-wounds of the back in the thoracic region, in such a way that the external wound and the spinal-cord lesion are on opposite sides. It is possible to demonstrate the direction taken by the weapon from the appearance of the external wound. It must be concluded that a great deal of power would be employed to injure the spinal cord if the weapon were a three-edged file.

William B. Bailly,¹ in an article on **suicide in the United States**, collected 10,000 cases of suicide, chiefly from the public press. Of these, 7781 were among males and 2219 among females. The number of suicides among married persons was slightly greater than among single persons, and single, widowed, and divorced women committed suicide more frequently than men under the same social conditions. Preference is shown to shooting and then to poisoning as a means of destruction, while hanging and drowning are selected less frequently than in the northern portions of Europe, and jumping, poisoning, and gas are more frequent in cities. Women prefer poisoning, while men usually select shooting. The motive in 20% of the cases is despondency, then come business losses, ill-health, and insanity, which account for 13 % each. Next comes disappointment in love. Alcoholism figures in the suicides among men. Grief and ill-health have a greater effect upon women than upon men in inducing suicide. The majority of suicides from grief, chagrin, alcoholism, despondency, domestic trouble, fear of disgrace, and disappointment in love occur between the ages of 20 and 30. Suicides from business losses and ill-health are more frequent between the ages of 30 and 40. Females are more apt to commit suicide earlier in life than males. Monday is selected as the favorite day for suicide, especially for dissipated workmen, which is probably accounted for by the fact that the man has spent all his money in dissipation and is then suffering from despondency and remorse. Females show preference for Sunday. The hour selected is among the 12 hours of the day before noon—those committing suicide on account of ill-health and insanity choosing the earlier hours, those from alcoholism or chagrin, the later ones; from despondency the afternoon hours are selected, while those committing suicide from disappointment in love and family trouble choose the late evening hours.

The number of **suicides during 1902 in Greater New York**² was 772, while 10 years previous the number was 241. The statistics are taken from the Bureau of Vital Statistics in the Health Department of New York city. There are more suicides in St. Louis than in any other city in the United States, New York city being fifth on the list. St. Louis holds the same place in suicide statistics as that held by Munich, in Bavaria, for a long time, and it is to be noted that both of these places have the reputation for manufacturing, if not consuming, a large amount of light malt liquors. The number of suicides in New York city is so great as to suggest the necessity of certain regulations to reduce its frequency. Of the number above cited, 268 committed suicide by means of carbolic acid, of which number 176 were men and 92 women. Shooting was selected by

¹ Med. Rec., Aug. 15, 1903.

² Med. News, Oct. 3, 1903.

176, and 118 employed illuminating gas, of which number 77 were men and 41 women. These represent two-thirds of the whole number, which legal regulations could do much to modify. For example, the sale of carbolic acid could be restricted; less publicity should be given suicides; and difficulties should be placed in the way of purchasing and carrying deadly weapons. In regard to suicides from inhaling gas, it would be well to limit the manufacturers as to the amount of carbon monoxid present in the gas supplied for domestic use, and, further, that hotels should be required to use electricity entirely for lighting purposes. If all these precautions were observed, there is no doubt that the number of suicides would be reduced.

In order to exercise **reform upon the criminal**¹ in Great Britain severe punishment is inflicted, but this system has perhaps only been successful in hardening the criminal. In this country the plan is on reverse lines, but apparently kindness does not have the effect of turning the criminal from his vicious habits. C. K. Clarke, of Kingston, is cited. He divides the criminals into—(1) The criminal insane; (2) moral imbeciles; (3) instinctive criminals; (4) occasional criminals; (5) habitual and professional criminals; (6) accidental criminals. The moral imbecile has no moral qualities, and performs criminal acts without viciousness or a sense of responsibility. The instinctive criminal is, on the other hand, vicious from the outset, and is beyond hope of redemption. The occasional criminal is morally weak, while the one who commits a crime in passion is usually a normal person who, under great excitement, loses control of himself and commits the crime. Clarke does not believe that crime is in all instances the outcome of disease, and is firm in the opinion that the alien degenerate should not be permitted entrance into Canada.

Alcoholism² appears to be the most important factor in the filling of the **jails and insane asylums**. C. A. Drew³ is quoted as stating that of 154 cases committed to the Massachusetts State Asylum for Insane Criminals in the past 2 years, only 7 % claimed never to have been users of alcohol. Of the 11 cases constituting the 7 %, 3 were epileptics and 2 were imbeciles. He believed that children of healthy, temperate parents suffer less from alcoholic insanity, even although they are heavy drinkers, than the second generation, who may drink only half as much, and the children of inebriate parents are always greatly handicapped.

J. W. Wherry⁴ discussed at considerable length the question of **responsibility and crime**. He believes that the most reliable test for responsibility is based upon the fact as to whether the crime is the outcome and direct result of the alleged insanity. He divides the insane into what he terms the "vicious insane," and the "conscientious insane." The vicious insane person is one whose judgment is imperfect and diseased, but who is actuated by "desire." This class he considers legally responsible. When an insane man with a diseased and imperfect judgment and weak or strong desire is actuated by his judgment, he is not legally responsible. He believes that when the crime is not the direct result of "delusions, hallucinations, or errors of judgment laboring under disease," the vicious na-

¹ Med. Rec., Apr. 23, 1904.

² Med. News, July 18, 1903.

³ Med. Rec., June 20, 1903.

⁴ Alienist and Neurologist, Nov., 1903, p. 423.

ture of the act should be suspected. To prove the relation between the crime and the insane state it is first necessary to make a diagnosis of insanity, which is best done by a physician and not by a jury; and, secondly, to prove the connection between the insanity and the crime, which is best done by the jury and not by a physician.

William W. Westcott¹ stated that there was a larger proportion of deaths of infants under one year of age from **overlying in England** than in any other country in Europe. In 10 years there were 15,009 cases in England and Wales; 1774 in the year 1900. In London in 1900 there were 615; in 1901, 511, and in 1902, 588. This represents one inquest out of every 14. The majority of these cases are under 4 months of age, which is accounted for by the fact that infants of more advanced years are stronger and better able to save themselves by arousing their parents before death has intervened. The accident is sometimes due to convulsions occurring while the parents are asleep. Such infants have bluish lips, livid complexion, clenched hands, flexed legs and arms, and blood-stained froth about the mouth. The tongue is sometimes protruded and discolored; the nails are blue; the whites of the eyes are reddened, and the conjunctivas are the seat of punctiform marks. In rare instances one child has overlain another, or a child has caused death by burying its nose and mouth in a pillow. There were 3 instances where a cat had overlain an infant. Cases are known where a child suckling from the breast of a drunken mother has become semistuporous, and thus was an easier victim to the overlying. It is rare for parents in Germany and France to sleep with their infants in the same bed, and the old Penal Code of Prussia made it a criminal offense for mothers to sleep in the same bed with children under 2 years of age. At present in Germany the rule is that when a physician reports a death from overlying the public prosecutor may punish the parent with imprisonment for 2 years, while charges of manslaughter or murder are possible. The want of space among the poor in England is the excuse offered by the parents for sleeping with their children. Westcott suggests that to provide cradles for the poor would be an excellent charity. In an experience of 20 years Westcott has only known 3 women to confess that they were intoxicated when they overlaid their babies, and in none of these cases did the jury recommend the women for trial.

P. Duflocq and R. Voisin² cited the case of an attempt at suicide in a young woman of 19 who took a pure **culture of the typhoid bacillus**. She passed through a typical attack of typhoid fever and finally recovered. The first symptoms began 3 days after taking the culture. There was violent headache, and in 5 days there was anorexia, and on the sixth day the patient was obliged to remain in bed. Rose spots were found on the abdomen on the eighth day; the size of the spleen was increased, and a positive reaction with Widal was obtained.

The Supreme Court of Washington, in the case of *State vs. Clark*,³ re-

¹ Brit. Med. Jour., 1903, p. 209.

² Arch. gén. de Méd., 1903, No. 35, p. 2197.

³ Jour. Am. Med. Assoc., May 21, 1904.

viewed the question of **insanity in crime**. The defendant maintained that the jury must acquit if it entertains a reasonable doubt as to sanity. In its address to the jury the court stated that every man is proved to be sane until the contrary is proved, and that the burden of proving the insanity is upon the defendant to establish by preponderance of evidence, and unless this is done, the presumption of sanity must prevail. The rule contended for by the defendant is sustained by the Supreme Court of the United States, by the highest court of Florida, Illinois, Indiana, Kansas, Michigan, Mississippi, Nebraska, New York, New Hampshire, Vermont, Wisconsin, and Tennessee. That when insanity is the defense in a criminal case, it must be established by a preponderance of evidence, is the rule in Alabama, Arkansas, California, Connecticut, Pennsylvania, Delaware, Georgia, Idaho, Iowa, Kentucky, Maine, Massachusetts, Minnesota, Missouri, Texas, Nevada, New Mexico, Ohio, New Jersey, South Carolina, Utah, Virginia, West Virginia, and England. In the states of Oregon and Louisiana insanity must be established beyond reasonable doubt. The Supreme Court of Washington states that insanity is easily and readily proved when it exists, and that it is easy to feign and difficult to disprove when it does not exist. It is not an injustice to presume the defendant is sane and to ask that the alleged insanity be proved.

STATE LAWS AND THE PRACTICE OF MEDICINE.

The Laws of New Mexico of 1903¹ provide that **sanitariums for tuberculosis**, which shall have been established within a year from the passage of this act, and upon which at least \$100,000 shall have been expended within 2 years after the passage of this act in the State of New Mexico, shall be **exempt from taxes** for 6 years after the expiration of 2 years' time after the passage of this act.

The Laws of New York of 1903² provide that any one shall be guilty of a **misdemeanor** who distributes or who is responsible for the **distribution of free or trial samples of medicines**, drugs, or chemicals in such a way or under such conditions that they may fall into the possession of children.

The Laws of North Dakota of 1903, Chapter 81,³ provide that any one shall be guilty of a misdemeanor who is **responsible for the distribution to any child** under 14 years of age of any **patent medicine** or any medicinal preparation containing poisonous drugs or drugs deleterious to health as a sample or advertisement.

Chapter 219 of the Laws of Kansas of 1903⁴ makes any one guilty of **misdemeanor** who shall **induce a child under 18 to practise or assist in giving exhibitions of hypnotism**, mesmerism, animal magnetism, or so-called psychic forces, or who shall permit a child under 18 to become a subject.

Chapter 61 of the Laws of Nebraska of 1903⁵ provides that a **licensing board** may **refuse to issue a certificate**, or may revoke one already

¹ Jour. Am. Med. Assoc., Dec. 5, 1903. ² Jour. Am. Med. Assoc., Dec. 5, 1903.

³ Jour. Am. Med. Assoc., Dec. 5, 1903. ⁴ Jour. Am. Med. Assoc., Oct. 24, 1903.

⁵ Jour. Am. Med. Assoc., Nov. 7, 1903.

issued, when the applicant has been guilty of **fraud or deception in applying for license**, or who is convicted of crime involving moral turpitude, or who is a habitual drunkard or drug habitué, or who has been guilty of unprofessional or dishonorable conduct, by which is meant any one who aids in inducing criminal abortion, who obtains fees for purporting to cure incurable diseases; any one who betrays a professional secret to the detriment of the patient; any one who advertises that he can regulate or establish the monthly periods of women if suppressed; any one promoting advertisements relative to the diseases of the sexual organs tending to injure the public morals.

The Laws of Minnesota, 1903,¹ provide that a superintendent of a hospital for the insane may **discharge or parole cases who are not dangerous** to themselves or to the community, who are capable of caring for themselves, or who can be cared for by relatives.

The Laws of Minnesota of 1903, Chapter 299,² provide that it shall be **unlawful to compel or require vaccination**, or to exclude children from school who have not been vaccinated except when there is an epidemic of smallpox. Boards of health and education may require vaccination by a duly licensed and practising physician to be selected by the person who has not been vaccinated, provided that children may be exempt from these provisions who hold a certificate from a reputable physician stating that vaccination would be dangerous to the child's health on account of his physical condition.

The Laws of Pennsylvania, No. 192,³ **forbid the selling or giving away of cocain** or any patent or proprietary remedy which contains this drug **unless prescribed by a registered physician**, dentist, or veterinarian. It forbids the refilling of such prescriptions and the prescribing of cocain by any physician to one known to be a habitué of the drug. A fine of \$100 or less, imprisonment for 6 months or less, both or either, may be imposed.

Chapter 71 of the Public Acts of Connecticut of 1903⁴ authorizes the examining committees to **accept the license of any state examining board** in lieu of an examination provided that—(1) It shall be satisfactorily shown that the license had been granted after an examination the standard of which is equal to that of the state of Connecticut; (2) that the holder of the license is a resident of Connecticut and intends to reside permanently there; (3) that he shall have been in actual practice for at least 6 months of the year which immediately preceded his application; (4) that he shall be of a good moral character and professional standing. A fee of \$5 is charged. If an applicant has been rejected, he shall not be eligible for reëxamination before the other examining committees until after the expiration of 12 months, but may be reëxamined by the committee before whom he first appeared.

Chapter 115 of the Laws of New Hampshire of 1903⁵ provides that **evidence of graduation from a registered college may be offered as**

¹ Jour. Am. Med. Assoc., Dec. 5, 1903.

² Jour. Am. Med. Assoc., Dec. 5, 1903.

³ Jour. Am. Med. Assoc., Dec. 2, 1903.

⁴ Jour. Am. Med. Assoc., Nov. 21, 1903.

⁵ Jour. Am. Med. Assoc., Nov. 21, 1903.

equivalent to the first year of a 4-years' course in a medical college, provided that such a course shall have included not less than the minimum requirements for admission to the second year, and that the registered medical school maintains state standards.

Chapter 61 of the Laws of New Hampshire of 1903¹ provides that the state shall take care of the dependent insane from January 1, 1909; that is, those cases which have previously been taken care of by the various counties. This puts an end to the establishing by any county of asylums for the treatment of the insane. The act further provides that the State Board of Lunacy may have the power to order the removal of any dependent case of insanity to the state hospital to be treated at the expense of the state.

Chapter 134 of the Laws of New Hampshire of 1903² creates the office of "medical referee." The appointment is made by the governor, and the term of service is 3 years. Each county is entitled to from 1 to 3 medical referees, whose duty is to take care of the body of any one who has died from violence or unlawful acts in his county, and he shall make a postmortem examination, when necessary, in the presence of 2 or more persons, one of whom shall be a physician. If the facts show that the case was a criminal one, the referee shall notify the attorney-general and the county solicitor. He has power to call a chemist or other expert to assist in the examination. For a view and inquiry without autopsy \$5 is allowed; with autopsy, \$25 and mileage.

Chapter 232 of the Statutes of California of 1903³ provides for the charge of \$200 annually and the licensing of all persons as principal or agent who shall conduct, as an itinerant vender, a business of selling drugs, nostrums, ointments, or any appliances for the treatment of diseases or injuries.

Chapter 234 of the Statutes of California⁴ provides for the licensing of all those who practise optometry, which is defined as meaning the employment of subjective and objective mechanic means to determine the accommodative and refractive states of the eye in the scope of its functions.

Act 178 of the Acts of Arkansas of 1903⁵ provides for the revocation of the license of a physician, surgeon, or person practising medicine who shall employ any solicitor or drummer, or who shall subsidize or employ any hotel or boarding-house, or who shall aid his business by the circulation of any circulars or cards, or who shall obtain compensation under the guise of curing incurable diseases, or who shall expose professional secrets obtained from his patients to the detriment of the patient, or who shall continue to practise medicine after he has become a habitual drunkard, or who shall prescribe while drunk. Such an one shall be punished also by a fine of from \$25 to \$200. Another section of the act provides that the license shall be revoked if a practitioner shall be convicted of any

¹ Jour. Am. Med. Assoc., Nov. 21, 1903.

² Jour. Am. Med. Assoc., Nov. 21, 1903.

³ Jour. Am. Med. Assoc., Oct. 24, 1903.

⁴ Jour. Am. Med. Assoc., Oct. 24, 1903.

⁵ Jour. Am. Med. Assoc., Oct. 24, 1903.

misdeemeanor involving moral turpitude. Section 3 provides that the license of any practitioner shall be revoked who commits criminal abortion, and that he shall be further punished by imprisonment from 1 to 5 years. Section 4 provides that such a person may appeal, but shall not practise medicine pending the appeal, and if he does so, he shall be punished in the same manner and to the same extent as if he had never received a license to practise. Section 5 provides that any one whose license has been revoked may apply at the end of a year for a new one.

The laws of Pennsylvania, 1903, No. 430,¹ appropriated \$8000 for the purpose of erecting and maintaining for 2 years a **sanitarium for consumptives** on the State Forestry Reservation in Franklin County. It authorizes the Commission of Forestry to make rules and regulations governing the sanitarium.

The Laws of Pennsylvania, 1903, No. 193,² provide for the **commitment, to a proper hospital or asylum, for the restraint, care, and treatment of those addicted to the use of alcohol or drugs.** The affidavits of at least 2 physicians are required, stating that the person has been examined and found in a condition to require restraint and treatment. These physicians must also appear at the hearing. The commitment shall not exceed one year, and may be reviewed under writ of habeas corpus. Advanced payment for board, treatment, etc., is required.

The General Laws of Texas, 1903, Chapter 115,³ impose a **fine of \$25 to \$250, or imprisonment not exceeding 6 months, upon any physician or person who provides any one known to be a habitual user of the same with morphin, opium, cocain, chloral, or any of the derivatives thereof.**

The General Laws of Texas, 1903, Chapter 125,⁴ provide \$5000 for the **erection and maintenance of a Pasteur Department** at the State Lunatic Asylum at Austin for the treatment of hydrophobia. The state provides free treatment for indigent patients, but others must give some remuneration.

In England under the Act of 1876,⁵ 319 persons were **licensed to conduct experiments upon living animals.** The report for the year 1902 shows that licenses were granted only upon recommendation of persons of high scientific standing, and to persons who are trained and educated to conduct experimental work and to profit thereby. The report further showed that there were 14,906 experiments conducted in 1902.

The Laws of New York of 1903, Chapter 221,⁶ provide for the **appointment of a medical inspector by the Commission of Lunacy.** He shall be a well-educated physician, a graduate of an incorporated medical college, and shall have had experience in an insane asylum. His salary shall be \$3500 a year and traveling expenses, and his duties shall be to inspect state hospitals and other institutions for the insane which come under the supervision of the commission. It shall also be his duty to examine, as

¹ Jour. Am. Med. Assoc., Dec. 12, 1903.

² Jour. Am. Med. Assoc., Dec. 26, 1903.

³ Jour. Am. Med. Assoc., Dec. 26, 1903.

⁴ Jour. Am. Med. Assoc., Dec. 26, 1903.

⁵ Boston M. and S. Jour., Sept. 24, 1903.

⁶ Jour. Am. Med. Assoc., Dec. 5, 1903.

far as possible, the patients confined, especially those who have been admitted since his previous visit.

MALPRACTICE.

Hon. Julius Mayer¹ discussed the subject of **procedure against the unlawful practice of medicine**. He stated that in New York State there was no legal definition of the practice of medicine, and it was, therefore, necessary in legal proceedings to determine whether the defendant had practised medicine as a matter of law as well as fact. The Court of Special Sessions of the City of New York, First Division, of which Judge Mayer is a justice, held that the practice of medicine "consisted in the ascertainment, or pretended ascertainment, of the malady or disease with which the patient was afflicted; that the diagnosing of the case by a person, whether he prescribed drugs or not, constituted the practice of medicine." His 3 suggestions consisted of: (1) The necessity of defining the practice of medicine; (2) there should not be a minimum fine or imprisonment for those practising medicine illegally; and (3) the advisability of devising some methods by which advertisements of a certain kind, such as those which advertise the cure of infirmities relating to the private life of a man or woman, are eliminated from the daily newspaper in the State of New York.

Charles Greene Cumston² states that the Egyptians **punished imprudent physicians severely**. He quotes De Pastoret, who showed that while a physician was not prevented from applying new truths, if harm to his patient should result from the application of the new principle, the physician was fined, or, in the event that the patient lost his life, he was beheaded. The Greeks, according to De Pastoret, admitted medical liability, and Tourdes is quoted as stating that Glaucus, a physician of Ephesus, was condemned to the cross because, when he left a patient to go to the theater, the patient imprudently ate during his absence and died as a result. Medical liability was admitted by the Roman law. For example, a physician, when treating a slave, was responsible to the master, and fell under the jurisdiction of the *Lege Aquilia*. If a physician operated upon a slave and neglected to care for him after the operation and the patient died, he was held to be in fault according to the terms of the law. If a patient died as the result of the improper administration of medicine by a physician, the latter was liable to the law. When the patient was a free man, the law of *Aquilia* did not apply directly. To obtain a direct application of the law of *Aquilia*, if necessary, the injured person should have his patrimony also involved. According to the ancient German law, a physician was required to give a security as a guarantee that he would be successful, and should a physician wound a patient while bleeding him, he was fined 150 ducats in gold, and should the patient die, the physician was at the mercy of the family, who could use its right of vengeance as it saw fit. According to this law, a physician could not bleed a

¹ Med. News, Jan. 30, 1904.

² Boston M. and S. Jour., Dec. 24, 1903, p. 699.

free woman unless the husband or some one relative was present. According to the Bengnot edition of the Assizes de Jerusalem, a physician of the middle ages was required to pay the value of a slave and to leave the city, if by his ignorance he caused the death of the slave. If the patient was a free man, the physician was guilty of malpractice, and not only did not receive his fee, but had his right hand amputated, and if the patient died, the physician was condemned to the gallows. The ancient French law held physicians and surgeons liable. Henry IV of France was the first to employ medicolegal experts, which were selected from the most capable surgeons, and who decided upon the questions involved. Charondas, a well-known lawyer of the sixteenth century, stated that surgeons were liable for accidents to patients due to their mistakes; and Papon, a judge flourishing in the time of Catherine de Medici, declared that a physician could not be held liable for injuries to, or the death of, a patient unless he could be found guilty of ignorant or too hardy treatment, and a legal examination should be held to determine the circumstances. Jean Duret, a physician of the latter part of the sixteenth century, stated that a physician who showed himself "an idiot" in both theory and practice of medicine was liable, and Brillouin, in his dictionary published in 1711, held that physicians were liable for their acts.

The Tribunal of Épernay¹ gave audience to a suit against the **Curé d'Igny-le-Jard** (Marne), who was **sued by a medical syndicate and a pharmaceutical syndicate** of Marne. He was convicted of malpractice and fined 500 francs for the illegal practice of medicine, and 200 francs for the illegal practice of pharmacy. The court allowed 500 francs to the syndicate of medicine and 100 francs to the syndicate of pharmacy for damage interests, and finally the abbé was condemned to pay the costs of the proceedings.

TOXICOLOGY.

I. Bing² described a **case of mercury poisoning** of quite unusual cause. A room in which 8 patients suffering from scarlatina were being treated was heated by steam which was regulated in the cellar by means of a mercury valve. This valve became disarranged, so that the pressure was great and the steam forced its way through the mercury and finally into the air-chambers of the room. All the patients became ill, suffering from dyspnea, cyanosis, vomiting, and increased temperature. Most of the patients recovered entirely the following day, but one child at the breast and a boy of 1½ years succumbed. The autopsy showed marked congestion of the lungs, and microscopically there were discovered fine bronchiectasis and atelectasis. Mercury was not obtained from any of the organs of the patients. When guineapigs placed in a chest were made to inhale steam that had passed through quicksilver in another chest, the animals shortly became dyspneic, weak, cold, and died either in a few hours or days. The postmortem examination of the animals showed that

¹ Jour. de Méd. de Paris, Jan. 3, 1904.

² Wien. med. Woch., Aug. 1, 1903, p. 1508.

the lungs were increased in volume, and that there was beginning pneumonic infiltration. Experiments showed that death was not the result of absorption of the quicksilver, but the irritation of the bronchi and alveoli which is caused by the union of the quicksilver and the steam resulting in hyperemia, atelectasis, as well as exudation in the alveoli.

Neubeck¹ reported a case of **fatal poisoning following the injection of mercury salicylate**, occurring in a woman, 36 years old, who was suffering from general syphilitic exanthemas. She was given subcutaneously 2.5 grains of a 10 % paraffin suspension of the drug. Three weeks after the last injection there developed high fever, diarrhea, aggravated skin eruption, and mild stomatitis. Two weeks later a rectovaginal fistula followed gangrene of the posterior vaginal wall. The autopsy revealed the presence of abscesses in the gluteal region and ulceration of the intestines. The contents of the abscesses did not reveal mercury. Neubeck found in the literature 3 other fatal cases due to the administration of this drug.

S. F. Holloway² described a case of **corrosive sublimate poisoning** in a man of 29, who bathed parts of his body with a solution of 60 grains of corrosive sublimate in 5 ounces of water for the relief of an eruption which he believed was due to scabies. In a short time he complained of tingling, which soon became severe pain. A papular eruption appeared on the groin and the abdomen, he twitched a great deal and was jerky in his speech. At the end of an hour he swallowed with difficulty and was tremulous. Four hours later there was violent retching and he was seized with a general clonic spasm lasting 20 seconds. These spasms recurred every 10 minutes, and were preceded by a general tremor. The patient finally recovered entirely, having suffered a transient weakness of the left hand.

E. Schäffer³ reported a case of **acute copper poisoning** in a child, who died 3 days after birth. The autopsy revealed the presence of extravasation of blood the size of a bean in the temporal muscle, as well as in the thymus gland and the connective tissue of the neck. Bloody mucus was present on the mucous membrane of the stomach, and punctiform hemorrhages were seen at the cardiac and pyloric orifices. Hemorrhagic spots were seen on the mucous membrane of the intestines, and a circular ulcer was found in the neighborhood of the ileocecal valve. Hemorrhages were observed in the kidneys and liver. An examination was made to discover the presence of arsenic, mercury, phosphorus, or other metallic poisons, but failed, while copper was found in parts of the intestines and liver. Microscopically there was a high-grade fatty change in the liver, heart, and to less extent in the kidneys. This was associated with parenchymatous degeneration.

Wrzosek, Horoszkiewicz, and Rzegocinski⁴ came to the following conclusions as a result of experiments: (1) **Anilin is a blood poison** as well as a poison to the central nervous system; (2) poisoning by anilin can be accomplished through either the lungs, stomach, or skin; (3) anilin is

¹ Med. Rec., Nov. 21, 1903.

³ Wien. med. Woch., May 28, 1904.

² Brit. Med. Jour., Nov. 7, 1903.

⁴ Wien. med. Woch., Feb. 20, 1904.

eliminated in the urine partly unchanged and partly as paramidophenol; (4) the symptoms of poisoning, besides the destruction of the red blood-corpuscles, the formation of methemoglobin, the production of cyanosis, jaundice, hemoglobinuria, and methemoglobinuria, are due to the changes in the nervous system; (5) the anatomic changes as a result of anilin poisoning are not characteristic; (6) death follows acute poisoning by anilin, at least in the animal, in consequence of paralysis of the nervous system.

Alfred Hind¹ related the history of a case of **poisoning by sulphonal** in a woman of 27 who was being treated for melancholia. She took 365 grains at one time. The patient was found comatose and could not be aroused. She was pale, the pulse was feeble, the respirations were 15, temperature 98° F. The knee-jerks as well as the corneal and radial reflexes were absent. The pupils were moderately contracted but reacted sluggishly. Two days later the respirations were 44, pulse 130, temperature 103.8° F. The general condition remained about the same. Treatment consisted of lavage of the stomach, enemas, and the administration of strychnin and digitalis. It was not until the end of the week that she was able to express herself intelligibly. At the end of 2 weeks she had practically recovered. Coma, absence of reflexes, and atony of the bladder and bowels were the prominent symptoms in this case.

Fernandez M. Clarke² reported a case of **veronal poisoning** in a girl of 19 who took 16 grains of veronal one evening and 24 grains the following evening, in the form of cachets. When seen by Clarke shortly after the last dose she was sleeping profoundly, but could be aroused with great effort. Her breathing was weak and slightly stertorous, and the pulse was slow and regular. The pupils reacted to light. Three days later an erythematous rash appeared over the body generally and her face was swollen. Later the patient took 128 grains in 3 days. During this time she suffered from delirium, coma, scarlatiniform rash over the face and arms, and she was very constipated. When the drug was removed, the patient soon recovered.

Gerhartz³ described a case of **veronal poisoning** in a hysteric woman of 31 who took 1 gram of veronal in the morning and 3 grams at one dose in the evening. She became cold, was seized with jactitations, her pulse became weak, but the respirations were quiet. The pupils did not react to external stimuli. Gerhartz believed that without active treatment the amount of veronal taken was sufficient to cause death from paralysis of the heart.

J. L. Whatley⁴ described a case of **sulphonal poisoning** in a man of 50 who took 20 grains of sulphonal for the relief of a cold in the head. In 6 or 7 hours he suffered from pain and irritation over the ankle-joint, where there developed circular patches of erythema, which also appeared at the knee and elbow, the metacarpal bone, and the wrist. There was some edema of the skin, and the rash disappeared on pressure. A blister formed 30 hours later, and 2 small patches appeared on the abdomen on

¹ Lancet, Jan. 23, 1904.

² Berl. klin. Woch., Oct., 1903.

³ Lancet, Jan. 23, 1904.

⁴ Lancet, Apr. 9, 1904.

the following day. The rash lasted about 7 or 8 days in all. The case is especially interesting on account of the small amount of the drug taken.

E. D. Newman¹ described a case of **turpentine poisoning** in a man of 57 who, after working as a varnisher for 5 months, developed symptoms which were due to the absorption of turpentine. He was nauseated and had great difficulty in expressing himself. His speech was thick, like that of a drunken man. His ideas were incoherent, he was exhilarated, and his muscular strength was lowered. He suffered from frontal headache and irritation of the bladder. He eructated, his taste was impaired, and he had especial difficulty in uttering words in which the letters "c, s, z, tt, and th" occurred. He had had one similar attack 12 years previously while occupied at the same trade.

Cordite² is composed of 58 % nitroglycerin, 37 % gun-cotton, and 5 % "mineral jelly." This substance was used as an intoxicant by the British soldiers in the Boer War, being obtained from the Lee-Metford Cartridge Co. It may either be taken into the stomach, or when ignited the fumes may be inhaled. Its first action is an exhilaration, the subject talking excessively soon after the drug is taken. This lasts about 2 or 3 hours, when the subject becomes sleepy and finally goes to sleep. There follows a severe headache, usually lasting for 36 hours. When a solution of cordite boiled down to the consistence of glycerin is mixed with beer, the effects are more intense.

The Bulletin de la Société de Pharmacie de Bordeaux (1903) described a case in which a **wife killed her husband by placing in his food 2 or 3 drops of croton oil** twice a day for 5 months. The man suffered from burning in the throat and stomach and frequent liquid stools, associated with intense colicky pains. The medical experts were unable to detect the presence of croton oil by any known tests, but Barthe found it on a cloth which had been used to wipe the bottle containing the drug. The autopsy revealed the presence of numerous superficial erosions and hemorrhagic dots.

H. Croizet³ stated that the **3 sources of poisoning by gases were carbon monoxid, illuminating gas, and carbonic acid gas**, of which the first is the most fruitful source. While peripheral neuritis may follow poisoning by these gases, paraplegia, anesthesia, and delirium are the most frequent sequels. In carbon monoxid poisoning the paralysis is peripheral and symmetric. Benzin and allied substances cause paralysis, vertigo, and anesthesia, analogous to the symptoms caused by poisoning by illuminating gas and carbon monoxid. Croizet has collected 13 cases of poisoning by carbon monoxid gas. The prognosis was good when neuritis did not develop, but when it did follow within a few days of the poisoning, the prognosis is about that of alcoholic neuritis. The treatment should consist of fresh air, sulfur baths, good food, the administration of quinin and nux vomica, and the application of chloroform liniment for the relief of the pain. Finally, massage, galvanism, and passive movements are employed.

¹ Med. Rec., 1904, June 25, p. 1043.

² N. Y. and Phila. Med. Jour., Nov. 14, 1903.

³ Lancet, July 11, 1903.

When 2 or 3 mouthfuls of **tobacco smoke** from a cigar were shaken up with a few drops of blood diluted with water, the blood immediately became pink, which is characteristic of blood containing carbon monoxid. The spectroscopic examination proved the presence of this gas. When mouthfuls of smoke from a pipe or cigaret were substituted, the results were more marked. Since cigaret smoke is inhaled, it is particularly harmful, as explained by this experiment.

The Royal Commission¹ made a report on the epidemic of arsenical poisoning in 1900. The report showed that some 700 tons of arsenical glucose and "invert" sugar, which were found at the works of Bostock & Co., were disposed of for textile and other purposes not connected with food after this firm went into liquidation. This firm in 1900 manufactured "table syrups," an analysis of which showed the presence of one grain of arsenic in a pound. Fourteen tons of one-pound tin cans were destroyed by order of the liquidators. The epidemic was confined to districts in the northwestern part of England, of which Lancashire and Stafford suffered the most. It was calculated that over 6000 persons were affected. The records show that there were 70 deaths due to arsenical poisoning, but no doubt the number was greater than this. The report showed that the birth-rate of Manchester, Salford, and Liverpool fell markedly in the third quarter of 1901, and that this was due to the epidemic. One set of cases showed inflammation of various mucous surfaces, causing coryza, laceration, gastrointestinal disturbances, peripheral neuritis of the sensory and motor nerves, associated in some cases with herpes, erythromelalgia, keratosis, and pigmentation of the skin. In another class of cases these symptoms were slight or entirely absent, the subjects complaining of burning hands and feet or skin eruptions which did not appear to be allied to those of arsenic poisoning. In still other cases the principal symptoms were those due to dilated heart, and neuritis which resembled that due to alcoholism. The report also dealt with the question of poisoning from arsenic in beer apart from the epidemic of 1900, and concluded that the great prevalence of alcoholic neuritis in drinkers of beer in Manchester and Liverpool before 1900 pointed to the fact that the beer in these two places was more likely to be contaminated by arsenic than in London and southern countries, for example, on account of the large amounts of arsenic in the malt used in these two cities. The outbreak of arsenic poisoning in Halifax in 1902 was investigated and it was discovered that most of the persons attacked were heavy beer-drinkers. There did not seem to be any evidence that the drug was received in any way other than through the beer. Samples obtained from the public-houses, in January, 1902, contained as much as $\frac{1}{60}$ grain of arsenious oxid in a gallon. They concluded that any quantity of arsenic in food is harmful and that food-manufacturers should make an effort to exclude arsenic from their products. In some of the cases of beriberi investigated there was some evidence that arsenic had been taken with the food, but it was impossible to conclude that cases of beriberi encountered on ships arriv-

¹ Lancet, Dec. 12, 1903, p. 1674.

ing at home ports could be attributed to poisoning by arsenic. The Marsh-Berzelius test is a method by which it is possible to discover 0.0014 grain of arsenic in a pound.

Ferranini,¹ in discussing **arsenic poisoning**, described some of the rare forms. He stated that ataxia associated with absence of the knee-jerk, Romberg's sign, anesthesia, and ocular disturbances may be observed. These symptoms are due to polyneuritis and not to a cord lesion. Arsenical neuritis may be differentiated from alcoholic neuritis by the fact that the latter is rarely due to acute alcohol poisoning, but usually occurs in the chronic drinker, and is characterized by chronic gastritis with catarrh and pyrosis, while in arsenical neuritis there is acute gastroenteritis. In arsenicism there is insomnia; in alcoholism, delirium. The sensory symptoms are less marked in alcoholic neuritis, while in the former desquamation is common. The paralysis in arsenical poisoning is usually confined to the fingers and toes, while in alcoholic poisoning the forearm and calf muscles are occasionally involved.

M. Goltman² cites a case of **poisoning by small doses of quinin**. The patient, a man of 35, took a small dose of quinin in a pill. In 20 minutes he was covered with large wheals. The following morning bullas appeared over the affected areas, and a day later the surface became raw and the temperature rose to 101.5° F., the pulse being 112. The patient recovered in a few days.

Colonel R. H. Quil³ described a **fatal case of poisoning by quinin sulfate** in a soldier who took 240 grains of quinin at one dose. After the ingestion of the drug the man complained of vomiting and retching, which were soon followed by unconsciousness. His face was pale and clammy, his pupils were widely dilated, he was insensible, the respirations were spasmodic, and the pulse was scarcely perceptible. In spite of active stimulation the man died in convulsions in a short time.

W. Coleman⁴ stated that **urotropin**, a product resulting from the action of formaldehyd on ammonia, caused not infrequently toxic symptoms when given in daily doses of 15 grains. While formaldehyd cannot be demonstrated in the urine of patients taking this drug, clinically the urine contains antiseptic properties. Some observers claim that it is irritating to the urinary passages. It acts as a diuretic and solvent of uric acid. Gastrointestinal irritation was observed in some cases, and a skin-eruption resembling measles followed its use in one case. Headache and ringing in the ears have also been observed. Experimentally albuminuria has been produced in rabbits. Irritation of the bladder is the most common of its toxic properties. Seven cases of hematuria as a result of the administration of this drug have been reported.

Lesser⁵ believed that **iodism comes from the absorption of the iodine compound in the form of iodine**. Free iodine or albumin iodine

¹ *Riforma Medica*, June 3, 1903.

² *Med. Rec.*, Aug. 23, 1903, p. 295.

³ *Med. Rec.*, Nov. 21, 1903, p. 822.

⁴ *Clin. Rev.*, July, 1903, p. 289.

⁵ *Deut. med. Woch.*, Nov. 12, 1903.

compounds have never been found after taking pure iodids. He believed that iodism may be prevented by—(1) Administering iodids in slimy substances, such as mucilage. This prevents the rapid absorption of the iodid. (2) By giving the drug in small doses frequently during the day. (3) By giving enemas of sodium iodid associated with opium to render absorption slower. (4) By using albuminous iodine compounds instead of the iodids. (5) By employing iodipin subcutaneously. The last method has the disadvantage that too little iodine is absorbed at one time to act sufficiently.

W. A. Caskie¹ suggests the use of **venesection in the case of opium poisoning**. By this measure he states that consciousness may be restored by the abstraction of some of the poison circulating in the blood.

Lewis A. Levison² described a case of fatal **formaldehyd poisoning** in a man of 60 who swallowed about 2 or 3 ounces of 30 % commercial formaldehyd. Soon after swallowing the drug he fell to the floor, and when placed in bed, tossed, groaned, and apparently suffered intense pain. The respirations were noisy, 30 a minute, and associated with loud mucous rales in the nose, throat, and mouth. The pulse was at first strong and 112 a minute. He was markedly cyanosed, and finally became unconscious and died shortly after the ingestion of the drug. The necropsy revealed the presence of liquid, dark, brownish-red blood; the mucous membranes of the esophagus, stomach, and upper duodenum were dark chocolate brown in color and of the consistency of leather. There was an excessive amount of mucus in the bronchi.

Erwin Thomson,³ in treating a case of follicular tonsillitis by the administration of 5 gr. of **aspirin** 3 times a day, believed that there developed, as a result of the administration of this drug, bullas of the cheeks and an alopecia of the scalp.

Franke⁴ saw, in a patient after the administration of **aspirin**, difficulty in swallowing, swelling of the upper lip and head, and increase in the pulse and respiration. Later an urticarial rash appeared over the entire body, but the following day the symptoms disappeared. He attributes the development of these symptoms to the splitting-up of the drug into phenol.

F. W. Luce⁵ cited 2 cases of the **acetanilid habit**. The first case displayed hysteric symptoms. She was emaciated, her legs and feet were edematous, the mucous membranes were blue, the skin and conjunctivas white, and the circulation was feeble. Albumin was present in the urine. The patient recovered under treatment in 6 months. The second case, a woman of 32, developed the habit after an operation for the relief of varicose veins of the broad ligament. She was emaciated, edematous, her mucous membranes were blue, and the urine contained albumin. This case also recovered under treatment. There seemed to be no inclination to return to the drug in these two cases, and after

¹ Brit. Med. Jour., Mar. 19, 1904. ² Jour. Am. Med. Assoc., June 4, 1904.

³ Interstate Med. Jour., Mar., 1904. ⁴ Med. News, Sept. 26, 1903.
Amer. Med., Sept. 26, 1903.

its sudden removal there was no depression like that which follows the removal of opium, cocain, and chloral in habitués of these drugs.

Minerva M. Newbecker¹ described a case of **strychnin poisoning** which is interesting from the fact that the drug was **introduced by inhalations**. In preparing a rat poison the patient mixed some corn with strychnin powder over which he poured hot water. He inhaled the steam that arose from this mixture. While still working he felt chilly and numb and developed muscular twitchings and jerkings which extended to the whole body. The jaws were stiff, the tongue was dry and cracked, the secretions were absent, and the urine suppressed. Newbecker calls attention to the importance of withdrawing the urine in the treatment of strychnin poisoning, as the alkaloid is excreted largely by the kidneys.

A case of death was reported as following **immersion in tanning liquid**.² A man, after falling into a tanning pit, was found to be shivering, cold, and blue. He vomited some brown liquid, suffered from intense diarrhea, and died in about 4 hours. The autopsy showed signs of irritant poisoning in the stomach and intestines, and death was attributed to collapse from the diarrhea following the effects of an irritant poisoning. The liquid, when analyzed, was found to contain an infusion of the bark of the acorn-cup of the Turkish oak. There was no arsenic or other poisonous ingredient found. It was the habit of the workmen to drink some of this liquid as a "pick-me-up." Two other similar cases have been reported.

Armand Gautier³ presented a report upon the **dangers of hair-dyes**. The characteristic symptoms of poisoning are: (1) The herpetic and eczematous eruptions, frequently accompanied by itching and smarting; (2) nausea, vomiting, ptialism, eructations, dyspepsia, and sometimes diarrhea; (3) insomnia, paresis of the legs, contractures, epileptiform states, and circulatory troubles; (4) lowering of temperature and the resistance of the individual to intercurrent maladies. Analysis of 2 of the solutions showed the presence of acetate of lead. One was a solution of sulfate of copper and pyrogallie acid. Another preparation was found to be composed of hydrogen dioxid, containing hydrochloric acid. Gautier concludes: (1) That all tinctures for the hair, the so-called vegetable tinctures, or those guaranteed to be exempt from metallic ingredients, should be suspected, and their sale should be prohibited when they contain toxic amounts of anilin or analogous bases or paraphenylenediamins. (2) That those preparations which are intended to nourish the hair contain very frequently salts of lead, sometimes copper, silver, vanadium cyanids. Their sale should be permitted only if the composition is placed upon the label, or at least a mention of the nature of the metallic salts of which it is composed. In all these cases it is important that the rules covering the sale of such substances should be observed. (3) That the sale of articles formed of hydrogen peroxid does not present any serious disadvantages.

¹ Jour. Am. Med. Assoc., Jan. 30, 1904.

² Brit. Med. Jour., Sept. 26, 1903.

³ Jour. de Méd. de Paris, Apr. 24, 1904.

P. M. Pilcher¹ concluded, from a study of 25 cases of **illuminating gas poisoning**, that the toxic effects are due to chemic changes in the blood by which carbon monoxid hemoglobin is substituted for oxy-hemoglobin. Further, that the symptoms are caused also by the diminished amount of oxygen in the arterial blood supplying the central nervous system. Treatment should consist in the administration of oxygen and the copious injection of salt-solution, preferably by direct blood-transfusion. Cardiac stimulants are also indicated.

Arthur J. Hall² stated that **caffein**, given in 1- or 2-grain doses every 2 or 3 hours, is effective in **destroying the appetite for alcohol**. He advises its administration in all forms of alcoholic toxemia.

BLOOD EXAMINATIONS.

J. W. Mallet³ substituted chickens for rabbits in obtaining an **immunized antiserum for the purpose of identifying blood-stains**. He was able to obtain satisfactory results, coming to the same conclusion as that reached by Dr. James Ewing, who was also able to obtain the chicken antiserum, which produced a precipitate with human blood at a certain degree of dilution. Monkey blood was unaffected. Mallet made further attempts to obtain a reaction which would distinguish the bloods of different races of men. For this purpose a chicken was injected 5 times, at intervals of a few days, with blood taken from negroes. The blood of the chicken was then tested with blood taken from a negro and a Caucasian. He claims that the precipitate obtained from the negro blood was much more marked and in weaker dilutions than the samples of blood from the white man. Mallet recognized the necessity of accepting these results with caution, as the experiment was only made once. He suggested the advisability of making similar experiments upon the blood of other races.

A. Robin,⁴ in the case of the State of Delaware *vs.* Elmer Collins, employed the precipitation method for detecting human blood. He concluded as a result of his studies: (1) That human blood is distinguishable by the biologic test from the blood of other animals, excepting possibly that of the monkey; (2) that an antiserum may be obtained by immunizing rabbits with human blood; (3) that the blood may be secured aseptically from the placenta most conveniently; (4) rabbits should receive 6 to 8 injections of serum. A dose of it should be from 8 to 10 cc. The injections should be made at intervals of from 3 to 4 days; (5) the potency of the antiserum should be estimated from small quantities of blood taken from the vein of the ear or any of the deep-seated vessels; (6) it is not necessary to kill the animal; (7) all solutions should be perfectly clear and the blood sufficiently diluted; the antiserum should be used pure; (8) control tests should

¹ Brooklyn Med. Jour., May, 1903.

² Boston M. and S. Jour., Sept. 24, 1903.

³ Virginia Med. Semi-Monthly, Sept. 25, 1903.

⁴ N. Y. Med. Jour., Mar. 12, 1900, p. 500.

be made on blood from domestic animals; (9) a distinct clouding in 30 minutes and precipitate in 2 hours indicate the presence of human blood; (10) the test should be made twice in medicolegal cases to avoid error.

E. N. Layton¹ made some confirmatory experiments with the **serum obtained from rabbits**. He concluded that the reaction is due to an antibody or other substance in the blood-serum of the injected animal, which causes a reaction with serum which is analogous to the one injected. The reaction does not occur when normal rabbit serum is employed. At a temperature of 37.5° C., especially when diluted solution is used, the reaction occurs more rapidly than at the ordinary room-temperature. The test is a very delicate one, requiring only a minute amount of stain and a single drop of the test-serum, and it is not interfered with by the presence of other bloods or foreign material except the albumin precipitates. Monkey blood can be differentiated when the test-serum is diluted to 1:500 with incubation or with a high dilution of the tested blood, and pure test-serum at the ordinary temperature. It was impossible to determine any difference between the blood of white and colored persons.

X-RAYS IN FORENSIC MEDICINE.

The Supreme Court of Minnesota, in the case of *Henslin vs. Wheaton*,² decided that **one applying the röntgen ray for locating a foreign body in the lung was not liable for action for malpractice if he exercised that amount of reasonable skill which is given by physicians and surgeons in good standing**. It also admitted the evidence of an expert witness who was not a physician or surgeon. The Supreme Court held that the witness was competent because the purpose for which the röntgen rays were used was the location of a foreign body, and that the röntgen ray is used generally by physicians, skiagraphers, electricians, professors of physics, and others for experimental and demonstrable purposes. It may be applied by any one who possesses a sufficient degree of scientific knowledge of its properties, and there is no reason why any one understanding it may not explain its application.

James Cameron³ used **skiagraphy to assist in the diagnosis of the fetal age** of a child that was born prematurely. By means of the röntgen ray he was able to localize the absence of the lower femoral and the presence of the ossification of the os calcis and astragalus. The sternal ossifications could not be made out, as they were obscured by the heart. The danger of too long exposure must not be forgotten.

W. Rolans⁴ believes that in time every person, upon reaching adult age, will be required to be **signalized**. It has been demonstrated by the researches of Bertillon that the anthropometric development of signalment is the basis of a very valuable method of identifying crim-

¹ Amer. Med., June 6, 1903.

² Jour. Am. Med. Assoc., 1904, vol. xlii, p. 486.

³ Brit. Med. Jour., 1903, p. 1204. ⁴ Boston M. and S. Jour., May 7, 1901.

inals. Rolans elucidated the system, which he believes to be twice as accurate as the ordinary system of measurement. He makes röntgen ray photographs of the bones, which not only give evidence as to their dimensions, but also as to their structure. This method has the advantage over any other in the cases in which the bodies have been burned or decomposed, or in those cases in which only certain parts of the body are found, such as a hand or a foot. Rolans has devised an apparatus for conducting these studies.

MISCELLANEOUS.

W. Heinaz¹ studied 1906 cases of tumor with a view to determining the **relation of traumatism to the development of tumors**. Trauma was associated in 219 cases. He found that malignant tumors developed more frequently after trauma than the benign tumors. Sarcoma is most frequent; then follow carcinoma, chondroma, myxoma, and endothelioma. Only 5.4 % of the benign tumors were traumatic in origin, while 15 % of 819 cases of carcinoma were found to be of traumatic origin. Trauma was said to be the cause in 66 out of 325 cases of sarcoma. One month to 3 years elapsed between the trauma and the development of the growth. In the opinion of Heinaz trauma is never the direct cause of the development of tumor, but alterations in the constitution of the tissues take place so that tumors may develop.

Brouardel² cited the interesting **case of a woman who**, during a nervous crisis, in order to remove the sense of constriction, plunged her hand into her mouth and **tore out her tongue**. A moderate amount of hemorrhage followed. Examination of the patient showed that she was anesthetic, and the pharyngeal reflex was absent. The surface of the wound was pink. The line of separation was behind the papillæ calciformes, near the superior border of the epiglottis behind the tonsils. Examination showed that the woman could be understood perfectly, and that speech was conserved. Cure followed rapidly, with integrity of speech persisting. Twelve cases are cited from the literature illustrating trauma of the tongue occurring in nonepileptic individuals. Brouardel concludes that for the accomplishment of this act two conditions should exist, namely, the insensibility in the region of the organ and contractures of the muscles of the tongue.

John Puntton³ describes the case of the **Freeman family**, which consisted of the parents and 8 children. Jennie and Fannie together entered 9 claims against railroad companies for damages in 2 years, all of which proved to be fraudulent. The mother, a woman of 43, was slatternly and dirty and had been several times arrested for theft. Jennie, a girl of about 20 years, was good-looking, and of gentle and pleasing manner. In less than 2 years she received over \$1000 for

¹ St. Petersburg. med. Woch., 1903, No. 36, p. 52.

² Jour. de Méd. de Paris, June 12, 1904.

³ Kansas City Med. Index-Lancet, Aug., 1903, p. 273.

alleged injuries. Her sister Fannie was a thief and received one claim of about \$375 for alleged sensory and motor paralysis of the lower legs. The fraud of a second alleged accident in which she claimed sensory and motor paralysis of the lower legs and loss of control of the bladder and rectum was discovered by the agents of the company, who watched her through a hole in the ceiling. Punton quotes the case of Moffett, who obtained \$10,000 from insurance companies for more than 70 claims. One of the methods used by Moffett was partly to remove a screw from the floor of a car by means of a screw-driver on the end of his cane. He or his partner would then stumble over the screw, and after having been carried home in a cab, would beat his ankle with a cane until it was swollen and bruised.

John Punton,¹ in discussing the question of **medical malingery**, states that in the majority of cases personal gain figures very largely. He divides these cases into 3 classes: (1) Those in which the patient involuntarily feigns disease under the impulse of fear or through morbid conditions; this class includes cases of hysteria or neurasthenia. (2) Cases in which the patient voluntarily exaggerates real symptoms; these cases include those individuals who seek to increase the amounts of benefits from some beneficial society or to prolong their stay in a hospital, and are usually lazy; this is probably the most common class of malingerers. (3) Cases of premeditated intentional fraud. Punton quotes the interesting case of Oram Hoskins, who claimed to have been struck in the back of the head in a railroad accident. He feigned idiocy and was awarded a verdict of \$35,000. The fraud was not discovered until Colonel R. M. Wynne, of Fort Worth, Texas, made the statement that the mother of the patient, Mrs. Hoskins, had visited him in the effort to engage him to take the case of her son, who intended to feign an injury the result of a railroad accident. Hoskins was then placed in a sanitarium, and when preparations of a bogus character were made for a certain operation upon his brain, he confessed his fraud. He and his mother were then indicted by the grand jury for conspiring to swindle the railroad company. Punton states that the principles covering the diagnosis of medical malingery are: "(1) The recognition and correct interpretation of inconsistent morbid physical and mental phenomena; (2) the exclusion and elimination of disorders of which the symptomatology does not agree; (3) their disassociation with known lesions of all kinds."

A. H. Nichols² cites a case illustrating the **French attitude toward privileged medical communications**. A physician of Marseilles, an official examiner of insane for 20 years, signed a certificate by which a man suffering from acute homicidal mania was restrained. The wife solicited the issuing of the certificate, and the physician made a careful study of the case before signing it. The man escaped in a few days from an institution to which he was committed on this certificate and became quite rational. He applied to 2 physicians, who gave him certificates stating that he was of sound mind. He applied for divorce on the plea

¹ Med. Rec., Jan. 9, 1904. ² Boston M. and S. Jour., 1903, vol. i, p. 683.

of conspiracy and unlawful restraint. The wife's defense rested entirely upon the testimony of the official examiner, who, knowing that he should reveal the facts of the case, believed that no action could be taken against him because he was official examiner, and that the contents of the paper were a matter of general knowledge, inasmuch as it had passed through a number of hands. The husband failed to obtain a divorce, as there was sufficient evidence of good faith on the part of the wife, but he sued the physician for \$4000 for revealing a medical secret, which is a violation of the penal code. The physician was exonerated at the first trial, in which the court held that inasmuch as his character had been attacked by the plaintiff, he was justified in revealing the facts. However, the higher court reversed the judgment of the Trial Court, holding that the strict letter of the law should be enforced.

David Cheever,¹ in discussing the subject of **privileged communications**, pointed out the fact that the Roman law protected the physician, and that in France it was a penal offense for a physician to divulge the secrets of a patient. On the other hand, the English law holds a physician guilty of contempt of court who refuses to answer questions relative to his patient. This law is also followed in all the New England states, as well as Alabama, Delaware, Florida, Georgia, Mississippi, North and South Carolina, New Jersey, Pennsylvania, Texas, Tennessee, Virginia, and West Virginia. In New York, however, the law forbids a physician to divulge information acquired while attending a patient in a professional capacity, when such information was necessary to enable him to act in that capacity. A physician may testify in the case of wills as to the mental and physical condition of the deceased, excepting such communications as would reflect upon the memory of the patient. Similar laws have been adopted in Arkansas, California, Colorado, North and South Dakota, Idaho, Indiana, Iowa, Michigan, Montana, Kansas, Minnesota, Nebraska, Missouri, Nevada, Ohio, Oklahoma, Oregon, Utah, Washington, Wisconsin, and Wyoming. In the opinion of Cheever, to divulge information confided by a patient should be considered unprofessional unless the patient consents, or it is necessary to defend himself when accused, or to expose crime.

The report of the Departmental Committee² appointed to inquire into **allowances to prosecutors and witnesses in criminal proceedings** first went into the history of the subject and then made some recommendations. It defined professional men as "lawyers, doctors, and members of such other professions as the Secretary of State may decide hereafter to include by order in this scale." It defined professional evidence as "evidence as to facts which have come to the professional man's knowledge in the ordinary practice of his profession, not brought before him in the first instance with a view to a prosecution." The report stated that the allowances made under this head had been hitherto inadequate, especially when doctors have been summoned to places distant from their practice. The committee recom-

¹ Boston M. and S. Jour., Sept., 1903, vol. ii, p. 252.

² Brit. Med. Jour., July 18, 1903, p. 142.

mended that the maximum allowance in the future should be one guinea a case for giving evidence in the town of residence, and not more than 2 guineas a day for more than one case. When evidence was given out of town, a guinea a day extra is allowed. He should further be allowed one guinea for the preliminary examination of each person made with a view to prosecution. In the opinion of the committee an expert witness was one "to whose notice a case with which he was previously unacquainted is brought expressly in order that he should be qualified by his knowledge to give evidence of facts ascertainable on the evidence of his opinion, where such opinion is admissible." Such witnesses should be rewarded as the court may deem reasonable. No especial recommendation is made of the traveling expenses in the case of professional witnesses, but ordinary witnesses are allowed traveling expenses, which in nearly all cases should be third-class. When a railroad is not available, a shilling a mile one way is allowed.

PUBLIC HYGIENE AND PREVENTIVE MEDICINE.

By SAMUEL W. ABBOTT, M.D.,
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INTRODUCTORY.

THE year 1904 was a year of marked progress in public hygiene: not so much, however, in the direction of health legislation as in that of sanitary work and in scientific research. An active stimulus to this branch of public work in the United States exists in the two national organizations, the American Public Health Association and the American Medical Association (the latter through the agency of one of its sections).

In addition to these organizations most of the States maintain separate State sanitary associations, some of which are virtually schools of instruction for health officers. An index of the degree of public interest in public health may be found in the relative amount of money contributed by different States for sanitary work. The most recent figures compiled upon this subject were contributed to the Paris Exposition of 1900, in which it was shown that the greatest *per capita* expenditure for sanitary purposes, so far as organized sanitary work by State boards of health is concerned, was made by Florida, Vermont, Massachusetts, Rhode Island, Texas, Mississippi, Maine, New Hampshire, and Minnesota, in the order named. In each of these States the expenditure for the purposes named exceeded one cent *per capita*, and in the first three it exceeded two cents *per capita*, while in each of the remaining States it was less than one cent. This statement should be qualified by the fact that in the Gulf States named the expenditure is employed chiefly for quarantine purposes. In several of the States, notably in Massachusetts, Vermont, New Hampshire, New York, Ohio, Minnesota, New Jersey, and Delaware, laboratories are now provided by State boards of health for the purpose of carrying on original research, as well as for chemic and bacteriologic work in aid of cities and towns. All these are giving efficient aid in preventing the spread of infectious diseases, and in securing the purity of water- and food-supplies. In some States the central board also provides the various serums and vaccines used in the prophylactic treatment of certain diseases.

An additional impetus to public sanitation has also been found in the exhibits of public health work which have been made at the two expositions held in the United States since 1900, that of Buffalo in 1901, and that of St. Louis in 1904. The latter, organized as a section of the

department of Social Economy, was equipped under the direction of Prof. Severance Burrage, of Purdue University, Indiana. The exhibit of the German Imperial Board of Health at St. Louis deserves special comment for its thoroughly instructive and progressive character. The catalog of this exhibit fills a book of nearly 250 pages. The exhibit of Japan was also one of special merit.

Another evidence of popular interest in sanitary work is shown by the formation, during the past year or more, of many State and national organizations for the prevention of the spread of certain diseases, notably tuberculosis, malaria, leprosy, and syphilis. The decline in the death-rate from tuberculosis in many countries in recent years may undoubtedly be accounted for, in part at least, by the increase in popular interest in the subject, and the consequent spread of popular information regarding it.

Prominent among the discoveries of the past year which have sanitary significance is the use of copper sulfate in the destruction of animal and vegetable microorganisms and algæ in public water-supplies and other inland waters. This question, however, appears to be limited by insufficient knowledge relative to the propriety of using for domestic purposes water thus treated.

Interest in tropical hygiene has received a decided stimulus in recent years by the improvements which have been made in the sanitation of tropical cities, and the consequent decrease in their death-rates. The beginning of active operations upon the Panama Canal in 1904, and the introduction of new and improved methods of sanitation along its route, can hardly fail to show marked changes for the better, when compared with the work of previous years.

THE MANAGEMENT AND CONTROL OF INFECTIOUS DISEASES.

Are sanatoriums for consumptives a menace to the health of the neighborhood? This question has arisen in several American, as well as foreign localities. The *Lancet*¹ calls attention to the conditions prevailing at Sandgate in England, a town whose population is not more than 2000, "and yet this small community received during last year 897 patients suffering with pulmonary tuberculosis, who were not isolated, but lived in private houses in the town, and took their exercise in the streets, or on the beach among the inhabitants." These private houses, the property of one Jones, were organized on a purely speculative basis, as so many lodging-houses or hotels. Somewhat similar conditions exist at Rutland, Mass., where the establishment of a large State sanatorium in a small town has been followed by the building of several smaller private houses organized for speculative purposes. [The question of possible harm, by way of infection to the surrounding population, was fully discussed before a legislative committee in Massachusetts, with the result that no definite evidence was presented to show that the death-rate from consumption had increased in those wards of cities where such

¹ June 11, 1904, p. 1688.

establishments existed. The reasons for this fact are to be found in the observation that outdoor infection of tuberculosis is of rare occurrence, while in-door infection from the same cause is very common.]

Sanatoriums for Consumptives in Germany.—The German Imperial Board of Health, in its catalog of the exhibit at the World's Fair at St. Louis, gives the following statement: "At the beginning of 1904 there existed in the German empire more than 90 lung sanatoriums with, altogether, 8000 beds; of these, 2500 are exclusively for female patients. If we calculate on the average 4 patients for every bed, in one year, it follows that about 32,000 patients can enjoy the benefits of these sanatoriums at the present time.* The expense for building and furnishing these lung sanatoriums amounted, up to the present time, according to a moderate estimate, to more than 40 million marks (nearly \$10,000,000). Besides the existing sanatoriums, the building of new ones is planned, some of which are in condition to be opened this year." As a basis for building expenses, calculation was made on 5000 marks for every bed. Models and plans for 60 of these sanatoriums were exhibited at St. Louis in the German exhibit.

Advantages of Treatment in Sanatoriums.—Parkes¹ enumerates the advantages of sanatorium treatment for consumptives as follows: (1) The public health would benefit by the withdrawal from among the general population of active foci of disease. A reduction in the prevalence of consumption would ensue when the system is thoroughly established. (2) The sanatorium treatment made available for sufferers in the early stages of the disease would restore to health and activity a certain proportion of those who under present circumstances succumb. (3) In the event of a patient being discharged relieved, but uncured, or in the event of a recurrence of the disease after discharge, the precautionary habits acquired by the patient while under treatment would largely tend to prevent during his illness the diffusion of infection which would otherwise occur in his own home and place of occupation.

Dispensaries for the Tuberculous.—Bretheau² favors the establishment of dispensaries for the treatment of consumptives, as a means of education, charitable assistance, and promotion of personal cleanliness in the home, not in any way opposed to sanatorium treatment, but as an essential adjunct to it.

Destruction of the Tubercle Bacillus in Milk by Heating.—Rullmann³ gives the results of experiments in heating milk to which definite quantities of tuberculous sputum had been added. The milk was heated and constantly stirred for an hour at a temperature of 68° C. (154° F.), with the result of destroying the bacilli, and without altering the taste or composition of the milk.

Ubiquity of the Tubercle Bacillus.—Flügge⁴ finds that while the tubercle bacillus is widely diffused, a considerable quantity⁵

¹ Public Health, Dec., 1903, p. 149.

² Les dispensaries antituberculeux; leur rôle hygienique

³ Ueber die Abtötung von Tuberkel-bazillen in erhit. Woch., Mar. 22, 1904.

⁴ Deut. med. Woch., No. 5, 1904.

actual infection. Preysz found that guineapigs inhaling 40 bacilli at each respiratory movement did not become infected, but when the number was increased three or fourfold, infection took place.

The Relation of Human and Animal Tuberculosis.—The Royal Commission appointed to report upon this subject made an interim report, May 16, 1904.¹ The following points were the subject of inquiry: (1) Whether the disease in animals and man is one and the same. (2) Whether animals and man can be reciprocally infected with it. (3) Under what conditions, if at all, the transmission of the disease from animals to man takes place, and what are the circumstances favorable or unfavorable to such transmission. This inquiry was undertaken in consequence of the view which had been expressed that the bacillus which gives rise to tuberculosis in the bovine animal is specifically distinct from that which gives rise to tuberculosis in the human being, and that therefore the presence of the bovine bacillus in the milk or flesh of the cow, consumed by man as food, is not to be regarded as a cause of tuberculosis in the latter. The inquiry was not begun by taking evidence (collecting the opinion of others), but by conducting experimental investigations at the outset, reserving the collection of evidence for a later period. The first line of inquiry was the following: To determine the effects produced by introducing into the body of the bovine animal, either through the alimentary canal as food or directly into the tissues by subcutaneous or other injection, tuberculous material of human origin, *i. e.*, material containing living tubercle bacilli, obtained from cases of tuberculous disease in human beings, and how far these effects resemble or differ from those produced by introducing into the bovine animal, under similar conditions, tuberculous material of bovine origin. Material from more than 20 cases of tuberculous disease in human beings was employed for experimentation, including sputum, and the diseased parts of the lungs in cases of tuberculosis, also from mesenteric glands, bronchial and cervical glands, and tuberculous joints. In 7 of these strains of human origin the introduction of human tuberculous material into cattle gave rise at once to acute tuberculosis, widespread disease being developed thereby in the lungs, spleen, liver, and other organs. In the remaining strains the effects were less conspicuous. In conclusion, the Commission says: "We have very carefully compared the disease thus set up in the bovine animal by material of human origin with that set up in the bovine animal by material of bovine origin, and so far we have found the one, both in its broad general features and in its finer histologic details, to be identical with the other. We have so far failed to discover any character by which we can distinguish the one from the other, and our records contain accounts of the postmortem examinations of bovine animals infected with tuberculous material of human origin which might be used as typical descriptions of ordinary bovine tuberculosis." The Commission makes this short interim report "for the reason that the result at which we have arrived, namely, that tubercle of human origin can give rise in

¹ Interim Report of the Royal Commission appointed to inquire into the relations of human and animal tuberculosis, London, 1904.

the bovine animal to tuberculosis identical with ordinary bovine tuberculosis, seems to us to show quite clearly that it would be most unwise to frame or to modify legislative measures in accordance with the view that human and bovine tubercle bacilli are specifically distinct from each other, and that the disease caused by the one is a wholly different thing from the disease caused by the other."

See also upon the same subject Cipollina,¹ Westenhoffer,² Moeller,³ and Muller.⁴

Tuberculosis in European Countries.—Prinzing⁵ presents the following figures for the mortality from tuberculosis in different European countries. The figures represent the death-rates per 10,000 inhabitants, and are mostly for the period 1891-1900.

COUNTRIES.	DEATH-RATES PER 10,000 INHABITANTS.		
	Tuberculosis of the Lungs.	Tuberculosis of Other Organs.	Total.
Germany	22.1	1.9	24.0
Austria	—	—	34.5
Hungary	—	—	36.4
Switzerland	19.4	6.8	26.2
Italy	16.3	2.4	18.7
Netherlands	13.6	5.6	19.2
England	13.9	6.2	20.1
Scotland	17.2	6.9	24.1
Ireland	21.3	6.5	27.8
Norway	18.9	5.3	24.2
Finland	26.6	—	—
Cities of Spain	25.3	11.2	36.5
" France	25.3	8.0	33.3
" Denmark	19.0	6.4	25.4
" Sweden	23.6	6.7	30.3

To the foregoing may be added the following figures for the New England States for the years 1892-1901.⁶ These figures are for consumption of the lungs only.

DEATH-RATES PER 10,000 LIVING, 1892-1901.

Maine	16.8	Massachusetts	20.8
New Hampshire	16.8	Rhode Island	19.8
Vermont	14.9	Connecticut	16.8
NEW ENGLAND			18.8

Tuberculosis in Greece.—Patrikios⁷ presents figures wherein it appears that while the mortality from tuberculosis has diminished in

¹ Beitrag zur dem Studium der Rinder und menschlichen Tuberculose, Berl. klin. Wochenschr., Feb. 23, 1903.

² Deut. med. Woch., April 6, 1903.

³ Deut. med. Woch. 1903.

⁴ l'Echo Médical du Nord, April 2, 1903.

⁵ Zeit. f. Hyg. u. Infectiouskr., 46, 1904, p. 517.

⁶ The Decrease of Consumption in New England,

⁷ La Tuberculose en Grèce, Athens, 1903.

nearly every European country, it has increased in Greece, at least during the ten years 1890 to 1899, comparing the earlier and later years of the period. In Athens there was an increase from a mortality of 34.6 per 10,000 inhabitants to 39.9 from the five-year period 1890 to 1894 to the period 1895 to 1899. In Patras from 25.9 to 28.8 in the same time, and in Corfu from 13.2 to 14.8 per 10,000. There was also an increase in all the smaller cities of Greece.

Tuberculosis. Decrease in New England.—Abbott¹ gives the following conclusions relative to the decrease of consumption in New England: (1) The death-rate from consumption in New England at the present time (1904) is somewhat less than 20 per 10,000 living inhabitants. (2) The death-rate from this cause has diminished largely in all the New England States, in some with fairly accurate registration, as much as 50 % in the half-century; and this decrease appears to be going on more rapidly than in earlier years. (3) The death-rate of women from consumption has decreased more rapidly than that of men, and is now less than that of men, while in earlier years it was greater. (4) This death-rate from consumption at every age of life has also decreased, but more at older than at younger ages. The term "consumption" in this paper refers to tuberculosis of the lungs (*phthisis pulmonum*), which accounts for about 75 % of the deaths from tuberculosis in New England.

The Air Exhaled by Consumptives in Quiet Respiration.—Koeltzer² experimented with 15 consumptives, allowing them to breathe quietly for 7 to 15 minutes upon open Petri dishes with nutrient media placed at a distance of 5 to 8 cm. from the mouth, carefully avoiding coughing or sneezing. In only one instance did inoculation with tubercle bacilli take place, and this was a patient with advanced laryngeal ulceration. The author assumes that the bacilli can only be thrown off from a moist surface by agitation, such as occurs in the bursting of minute bubbles, or as probably occurred in this case by the vibration of the ulcerated vocal cords during expiration. He summarizes his conclusions as follows: (1) The aphorism that "the air exhaled by phthisical patients during quiet respiration is completely free from tubercle bacilli" should be altered in this wise: "the air of quiet respiration in phthisical patients is not germ-free; nevertheless, tubercle bacilli are only exhaled under special conditions, and then only in small numbers, and that in practice we cannot consider the expiratory air as an essential source of infection." (2) The cause of the infectivity of the expiratory air is the formation of spray from the mucopus in the lungs which we plainly hear as crepitations. (3) The bacilli exhaled during quiet expiration are so few in number that they can easily escape experimental proof. (4) The possibility of infection by the air of quiet expiration must be extremely remote, compared with that offered by the pulverization of sputum, and the production of spray during the act of coughing. (5) Severe tuberculosis of the larynx favors the infectivity of the air of quiet expiration quantitatively, so that the number of bacilli exhaled is capable of experimental proof."

¹ Publications of American Statistical Assoc., Mar., 1904.

² Zeit. f. Hyg. u. Infectiouskr., xlv, pt. 2.

Tubercle Bacilli on Public-house Floors.—Persons employed in public houses (bartenders and saloon-keepers) are especially liable to contract consumption, probably in consequence of consumptive persons spitting on the floors. Allan¹ submitted samples of sputum from the floor of a bar in a district where consumption was prevalent to Prof. Klein, who found tubercle bacilli in active condition. It was suggested that instead of sweeping out the bars, it would be better to have them thoroughly scrubbed or mopped with a hot solution of washing soda ($\frac{1}{2}$ pound to 3 gallons of hot water), or to sprinkle them at night with a reliable disinfectant.

Tuberculosis in England.—Newsholme² notes the following as the measures which are at present contributing to the extinction of tuberculosis in England. (A) Means of ascertaining the existence of the disease: (1) Bacteriologic diagnosis; (2) notification of cases, voluntary or obligatory. (B) Direct preventive measures: (1) Law against expectoration in public places; (2) disinfection and cleanliness; (3) sanatoriums; (4) general sanitary improvement. (C) Education of the public and of patients in the importance of the foregoing measures. The author also discusses the relation of the food-supply to the prevalence of tuberculosis, and shows that while the price of wheat diminished from 775 pence per quarter in the 5 years (1838–42) to 343 pence in the 5 years (1896–1900), the death-rate from phthisis declined from 3880 per million to 1321 per million in the same time.

Tuberculosis in Prisons.—Schäfer, of Munich,³ found in a Bavarian prison that 13 % of the prisoners admitted were suffering from tuberculosis. Almost half of the prisoners were also suffering from some form of tuberculosis. Schäfer lays special stress on the food as a vehicle for the transference of the bacilli into the body. He found cultivable tubercle bacilli in the cooking dishes, even after the dishes had been washed. He recommended the isolation of the sick from the healthy, the provision of country colonies for tuberculous prisoners, together with absolute cleanliness. Theodor, commenting upon the same topic, states: (1) That prisons favor a rapid form of phthisis; (2) the tendency to spontaneous cure found outside is not noticed in prisons; (3) they favor in a high degree the continuance of epidemics of tuberculosis.

Transmission of Diphtheria by Water.—Leiter and de Stoutz⁴ gave the results of experiments which showed that "potable water may occasion the transmission and propagation of diphtheria. . . . During at least ten days the Löffler bacillus remained alive in the water, and at first it seemed to thrive in it in a very marked manner."

Diphtheria Bacilli in the Throats of the Sick and the Well.—Graham Smith⁵ presents the following summary of observations as to the

¹ Monthly Health Report of Westminster, Jan., 1904.

² Jour. of Hyg., iii, No. 4, 1903.

³ Vierteljahrs. f. öff. Gesundheitspflege, Suppl., 1902.

⁴ La Rev. Méd. de la Suisse Rom., quoted in Canadian Med. Jour., June, 1904.

⁵ A study of the virulence of the diphtheria bacilli isolated from 113 persons, and of 11 species of diphtheria-like organisms, together with the measures taken to check an outbreak of diphtheria at Cambridge (England) in 1903. Jour. of Hyg., April, 1904, p. 258.

presence of diphtheria bacilli in the throats of well persons, of those who are ill with diphtheria, and of those who have been exposed to the sick: (1) Diphtheria bacilli have been found in a considerable proportion of persons who have come into contact with cases of diphtheria or with other infected persons. (2) Such persons have been shown to be a grave danger to the public health, especially when frequenting schools or institutions, and to constitute the usual channel by which the disease is spread. (3) Very satisfactory results have followed on the isolation of convalescents from the disease and of "infected contacts," where two or more consecutive negative examinations have been required before release. (4) Carefully conducted investigations among healthy persons, who have not at a recent date been in contact with diphtheria cases or infected contacts, have shown that virulent diphtheria bacilli are very seldom (2 examples among 1511 persons) present in the mouths of the normal population. This fact renders the discovery and isolation of infected persons a practicable possibility, and offers a fair prospect of discovering and isolating the majority of them during any outbreak. (5) Of the 113 examples of the diphtheria bacillus tested for virulence during this outbreak, 87 were fully virulent, and 25 were completely devoid of virulence. One virulent bacillus, for reasons explained, did not kill the inoculated animal till the twelfth day. No partially attenuated bacilli have been found. (6) In the majority of persons in whom diphtheria bacilli were found, who had recently been in contact with cases of the disease, the bacilli were virulent. (7) Nonvirulent bacilli were discovered in 1 or 2 out of every hundred persons examined, whether contacts or noncontacts. The proportion of persons infected with this organism is therefore the same among contacts and persons who have not recently been in contact with the disease. (8) The absence of polar bodies is no indication of a want of virulence in diphtheria bacilli, and their presence is no indication of the possession of virulence. (9) Hofmann's pseudo-diphtheria bacillus is a very common inhabitant of the mouths of poorer class children. It is less common among adults, even of the same class. The proportion of persons infected with this organism bears no relation to the proportion infected with the virulent diphtheria bacillus. Notified persons and infected contacts harbored this organism in the same proportions as the healthy school children with whom they had been associated. Examples of the Hofmann's bacillus isolated from the first cultures obtained from diphtheria cases were totally nonvirulent to guineapigs. There is no evidence that it is in any way pathogenic to man. The distribution of this bacillus points to the conclusion that it is carried from mouth to mouth in the same ways as the diphtheria bacillus, and therefore its widespread prevalence in schools attended by the poorer children is significant, as showing how widely spread and uncontrollable an outbreak of diphtheria may become, unless measures are early taken to deal with infected contacts. (10) Organisms morphologically resembling diphtheria bacilli are not infrequently found in the throats of healthy persons, and require careful examination by culture before they can be identified. (11) The xerosis bacillus is a common

inhabitant of the normal conjunctival sac, and organisms closely resembling it are present in the eyes of some animals. (12) Virulent diphtheria bacilli have undoubtedly been found in ear discharges, but diphtheria-like organisms appear to be extremely common in the ear discharges of scarlet fever patients, and in the ears of normal persons. Consequently no conclusions as to the frequency of the diphtheria bacillus in the ears of scarlet fever patients can be made without the thorough examination of any organisms which may be discovered both by cultural and virulence tests. (13) Diphtheria-like organisms occur in the throats of healthy birds.

Results of the Use of Diphtheria Antitoxin.—Tjaden¹ presents the results of the use of diphtheria serum in Bremen, for the single year 1894 previous to the introduction of antitoxin, and for the succeeding 9 years, which are as follows:

YEARS.	REPORTED CASES.	DEATHS.	FATALITY PERCENTAGE.
1894	459	125	27.2
1895	361	34	9.4
1896	587	56	9.5
1897	608	42	6.9
1898	343	14	4.1
1899	252	22	8.7
1900	194	24	12.3
1901	387	38	9.8
1902	580	55	9.4
1903	649	41	6.4

Diphtheria in Birds.—Streit² presents the results of an inquiry into so-called fowl diphtheria as it occurs in Canada. He confirms the observations of previous inquirers, that this disease has no connection with human diphtheria. It presents analogies in its pathologic and clinical aspects with the latter disease, but is caused mainly by a bacillus which the author names the roup bacillus. Similar symptoms can be caused by other microorganisms, such as *B. pyocyaneus* and *B. diph. columbarum*.

Confirmatory Cultures in Diphtheria.—J. S. Billings, Jr.,³ finds that, while in a certain percentage of cases the diphtheria bacillus fails to appear in the first cultures, the failure is generally due to a conjoined infection with the septic micrococci. Aside from these cases, the statement that the case is probably not diphtheria can be made on one negative culture up to the tenth day of the disease. Valid reasons for requesting a confirmatory culture in negative cases are: (1) When there is no growth whatever on the culture-mediums; (2) when there is complete contamination and liquefaction of culture-mediums in cases which are clinically diphtheria; (3) cases where there are suspicious bacilli; (4) in croup cases in which the membrane is limited to the larynx and the duration of the disease is less than 5 days. Dryness of culture-mediums,

¹ Hyg. Rundschau, July, 1904, p. 613.

² Zeit. f. Hyg. u. Infectiouskr., 46, pt. 3.

³ N. Y. Med. Jour., Sept. 12, 1903.

scanty growth, and the recent use of antiseptics with satisfactory growth of other organisms than the diphtheria bacilli, do not alone furnish sufficient grounds on which to request a confirmatory culture.

The Conflict with Malaria.—It is stated that when, 10 years ago, Koch¹ was face to face with the combat with cholera, it was recognized that the preventive measures must be directed against the germs which could in every case be demonstrated by bacteriology to be the active agents in the spread of the disease. When he had time to turn his attention to the diagnosis of malaria, he found in a similar way that the blood was infected with a parasitic organism easily destroyed by quinin, which, although it was wholly different from that of cholera, might be attacked and dealt with on a similar principle; and, by means of his experiments at New Guinea, he satisfied himself not only that it was possible to destroy the malarial parasite in human blood, much in the same manner as in the case of the cholera germ; but also that the active agent of malarial diseases was capable of existing only in man and in certain insects of the gnat tribe, and was not to be found in any other organism. This rendered it possible to undertake the necessary preventive measures which have been adopted with complete success. Accounts are then given of the conflicts with malaria at Brioni (Istria) by P. Frosch, and at Puntacroce by Bludau. A report is printed of the malaria-expedition to German Southwest Africa by Vagedes, and descriptions follow of the conflicts with this disease at Daressalam by Ollwig, and in the Tuscan Maremma by B. Gosio. This last investigator declares that only time and a sufficient supply of quinin are needed to stamp out the disease. E. Martini treats of the precautions taken to avert an outbreak of malaria at Wilhelmshaven, and Dönitz gives an account of the various species of the anopheles which serve to spread the disease in the different countries where the question has been actively studied. All these essays are illustrated with maps and diagrams.

Immunization with Diphtheria Antitoxin.—The Imperial Board of Health of Germany publishes the results of an investigation relative to the occurrence of diphtheria in persons who have been immunized by serum treatment.² A series of 14 questions had been issued to physicians throughout the German empire relative to the use of antitoxin for immunization in families, schools, hospitals, and other public institutions, the persons immunized being divided into 2 classes, those over and those under 12 years of age. Physicians were requested to state their experience with antitoxin as used for the purpose of immunization. The whole number of physicians recording observations was 2352, of which number only 380 had observed one or more cases of diphtheria among persons who had been immunized. The whole number of exposed persons who were immunized, as noted by these physicians, was 31,740, and the number of cases of diphtheria among these persons (all of whom had been exposed to diphtheria) was 897, or 2.8 %. Of the whole number, 26,807 were

¹ Zeit. f. Hyg., 43, 1903, p. 1.

² Medizinal Statistische Mitteilungen aus dem Kais. Gesundheitsamte, 8, 2, Berlin, 1903.

under 12 years of age. The time in which illness (diphtheria) followed the immunization was from 4 hours to 2 years. The indefinite and variable length of time elapsing between the immunization and the appearance of diphtheria detracts largely from the value of these returns, while, as is stated in the conclusions of the report, many persons who were reported as having been attacked with diphtheria within a few hours after immunization may have contracted the disease by exposure at a time previous to such immunization. It is pretty safe to affirm, however, that out of 31,740 exposed persons, mostly under 12 years old, under ordinary circumstances many more than 897 would have contracted the disease.

Hospital Isolation of Scarlet-fever Patients.¹—The practice of isolating scarlet-fever patients in hospitals provided for this purpose having been vigorously attacked by several English medical officers, the subject was thoroughly discussed by the Society of Medical Officers of Health, and a resolution was adopted by the Society to the effect that "a full and searching inquiry into the whole system should be held." The general opinion, as stated in an editorial in "Public Health," was, that any failure of the system was due largely to defective administration. "Hospitals play a very important part in the methods at our command for dealing with infectious diseases, and the sooner the administration of those which are defective is put on a proper and efficient basis, the better it will be." [Reference does not appear to have been made in this discussion to the subject of defective notification. In every large city where hospital isolation is provided a considerable proportion of those attacked, living in well-to-do families, are treated in their own homes, and while isolation is required, it may be of a very different character from hospital isolation. Again, many cases, mild in degree, but still quite as infectious as severe cases, are treated in families, without the attendance of a physician, no notification whatever being made. And, lastly, cases are by no means rare in which the disease is wholly unrecognized. All these classes may be, and undoubtedly are, fruitful sources of infection, so that it becomes difficult to estimate the actual value of a system which, from the nature of the case, is imperfect in its application.]

Scarlet Fever Due to Infected Milk.—Tingvall² reports an epidemic of scarlet fever in Westeras, Sweden, 22 cases in a city of 12,000 inhabitants. All of these cases were in persons who took milk from one milkman in whose family a case of this disease existed.

The Control of Measles.—Jones³ presents a plan for united action of health authorities in preventing the spread of measles. In this paper, and in the discussion which followed, it was the general opinion that measles were spread largely by the agency of school attendance, and that those who die are mostly under 5 years of age; hence if children can be protected from an attack in their early years, the mortality may be materially diminished. To accomplish this result, early information must be

¹ Public Health, Jan., 1904.

² Hyg. Rundschau, 3, 1904.

³ Public Health, June, 1904, p. 531.

obtained. Notification is of no use, unless accompanied by energetic action. In crowded towns school closure is of little use, since the homes of children are so close together that intercourse is continually taking place between them. A Health Visitor, however, can do much good by warning parents of the danger of the disease. One suggestion is worthy of trial, that of excluding from school only those children who have not had measles. A still better method is that of limiting the age at which children begin school attendance to 5 or 6 years. Further information is needed on the following points: (1) As to the time when infection in measles begins and ends. (2) As to conveyance of infection in clothing; instances of families (with susceptible members) taking up residence in rooms or houses which have not been disinfected after measles; instances of contacts conveying infection. (3) As to the period when death occurs in an attack of measles.

Smallpox and Isolation in Germany.—In consequence of the claim made by antivaccinationists that the spread of smallpox may be efficiently prevented by notification and isolation, Bruce Low, on behalf of the Local Government Board of England,¹ visited Germany and conferred with the authorities of Berlin, Cologne, Frankfort, Wiesbaden, Mainz, Munich, Nuremberg, Dresden, Leipzig, and Stuttgart, inspected the accommodations made for smallpox patients, and consulted all necessary documentary evidence on the subject. The provision for isolation is nowhere of such a kind as would satisfy English practice. Except in rare instances separate hospitals are not provided, and the patients are removed to the general hospital of the town or district, where usually a pavilion is kept in readiness. In a few instances this pavilion is separated from the rest of the hospital by a wall, and at Dresden a temporary wooden fence is placed around it when a case of smallpox is admitted. The place of isolation is supplied with food from the same kitchen; the soiled linen of the smallpox patients is sent to the general laundry after being disinfected. The nurses and any other persons whose business brings them into relation with the smallpox pavilion are revaccinated as a matter of routine. It appeared that most of the cases of smallpox which now occur in Germany are in the persons of foreigners, chiefly Russians, Austrians, and Italians, many of whom come to Germany for industrial purposes. Many outbreaks occur in towns on or near the Russian or Austrian frontiers, especially the former. Russian and other immigrants passing through Germany have been known to infect railway employees, and infection has been traced to infected articles imported at Hamburg and Bremen. With these facts in view, Low compares the smallpox mortality of Germany with that of England for the 12 years 1891 to 1902. In a population of over 56 millions the total German mortality from smallpox was 607 in the 12 years, the highest being 108 in 1892, and the lowest 5 in 1897. In England with a population only two-thirds as large the total mortality from smallpox in the 12 years was 6761, the highest in any year being 2461 in 1892, and the lowest 25 in 1897. Low concludes that the German plan

¹ Med. Mag., May, 1904, p. 306.

differs from that of England by reason of the imperfect character of the so-called isolation. Disastrous results to other persons from bringing smallpox to the general hospital have been seldom observed, and this is with one consent attributed to the protection afforded by statutory vaccination and revaccination, without which the method would undoubtedly break down. By this method Germany is able to dispense with separate smallpox hospitals and separate administration for the purpose of providing against the disease, and is thus freed, not only from a great expense, but from the suffering and inconvenience entailed by the adoption of costly and half-way methods of dealing with epidemics as they arise, instead of preventing them by thorough vaccination and revaccination of the population.

Vaccination: Its Effect on the Death-rate from Other Diseases than Smallpox.—Oldright¹ quotes English figures to show that, independently of smallpox, vaccination reduces the death-rate from other diseases of infancy and childhood. The general result showed a death-rate of 16.01 deaths per 1000 among the unvaccinated, and only 8.49 per 1000 among the vaccinated. He also quoted the experience of the London smallpox hospitals since 1884, in which 2198 persons had been employed. Of these, only 17 contracted smallpox, of whom 13 had not been revaccinated, and 4 had never been vaccinated. Not one of the 2198 who had been properly vaccinated contracted smallpox.

Extinction of Rabies in Great Britain.—The British Board of Agriculture, in its last annual report,² says: "An entire year has passed without a single case of rabies having been detected in Great Britain." "The policy adopted by the Board was to prescribe the general requirement of the muzzling of dogs throughout the districts wherein the disease was known to be prevalent. The restrictions were maintained till at least six months had elapsed since the last confirmed case. At the same time precautions were taken to guard against the reintroduction of the disease from abroad." The work began in 1896, and from that time the cases reported among dogs were as follows: 672 in 1895, 438 in 1896, 151 in 1897, 17 in 1898, 9 in 1899, 6 in 1900, 1 in 1901, 13 in 1902, and none in 1903. The report further states: "The fact that no case of rabies has been confirmed since November, 1902, puts it almost beyond question that the disease has now been eradicated from Great Britain, and that unless it be reintroduced by means of a dog which has contracted the disease abroad, its recurrence need not be apprehended. The importation of an infected animal cannot be prevented so long as the landing of dogs from abroad in this country is permitted. If all dogs imported are effectively isolated for a period sufficient to render it practically certain that they are not affected with rabies, there is no reason why the disease should again be communicated to dogs in this country."

The Soil, Not the Water, the Transmitter of Cholera and Typhoid.—Emmerich and Gemünd³ have been conducting extensive

¹ Transactions of Eighteenth Annual Meeting of Executive Health Officers of Ontario.

² Proceedings under the Diseases of Animals Acts, London, 1904, p. 33.

³ Münch. med. Wochen., li, No. 26.

research which has demonstrated that the nitrates have remarkable power to enhance the virulence of cholera germs. Guineapigs tolerated without apparent reaction as much as 1.5 gm. sodium nitrate ingested in 10 cc. albumin. They also tolerated a considerable amount of cholera bacilli by the mouth. But when the two were combined, the animals rapidly succumbed, with symptoms of cholera. The same result must inevitably follow when man ingests cholera bacilli and nitrates. The bacilli transform the nitrates into nitrites and the latter cause the intoxication. Plenty of nitrates are ingested in vegetables, etc., to cause severe intoxication when transformed into nitrites by any agency. In a dry season plants contain an unusual amount of nitrates. When there are no nitrates in the stomach, the action of the cholera bacilli is comparatively mild. Pettenkofer surmised that the soil, rather than the water, was the paramount factor in epidemics of cholera, and this surmise has been confirmed by the research described. It establishes that the drinking-water can never be incriminated. Water is rapidly cleared of pathogenic germs by the action of protozoa, especially the flagellates. These are the guardian hosts of the drinking-water, rapidly destroying all the pathogenic bacteria that find their way into it. They accomplish this task in a few minutes in a brook or river, but may require several days for it in pure spring-water. Nature has protected water against pathogenic bacteria by the hosts of protozoa; the more polluted the water, the more numerous the protozoa. Typhoid and cholera bacilli multiply in the soil, not in the water, and only in the upper layers of the soil, where they can be easily reached and destroyed in combating epidemics. Flushing the ground with water would accomplish this.

Action of Beer upon Typhoid Bacilli.—Turmont¹ gives the result of observation on the action of beer on typhoid bacilli. Cultures added to beer were killed in one-half to 67 hours, the bactericidal effect being proportioned to the amount of lactic acid in the beer. Beer weak enough to allow survival of bacteria becomes more bactericidal as it ripens, since the bacilli in it generate more lactic acid, which in turn has a destructive action on them.

Dissemination of Typhoid Fever by Butter.—Bruck² believes that typhoid fever may be spread by butter. Experiments were made by washing vessels in which cream was kept with water contaminated by rinsing in it a cloth slightly soiled with typhoid stools. Butter made from this cream developed colonies the first day. Living bacilli were found in the butter as late as the twenty-seventh day.

Effect of Lemon-juice (as Lemonade) upon Typhoid Polluted Water.—Bissell³ concludes, after a series of experiments, that (1) lemon-juice in the proportion of the juice of one lemon to an ordinary glass of sterilized distilled water (6 to 8 ounces) has not a decided germicidal action on typhoid bacilli; (2) this method of treating water to prevent a possible typhoid infection should be discouraged.

¹ Public Health, June, 1904, p. 529.

² Deut. med. Woch., 26, 1903.

³ Transactions of Am. Public Health Association, vol. 29, p. 353, 1904.

An Unrecognized Source of Typhoid Infection.—Barringer¹ states that over 85,000 persons cover each mile of roadbed in the United States annually. The excreta must of necessity foul the roadbed, since the deposits are made just outside the track, favoring rapid desiccation and dissemination by the wind. Students arriving at the University of Virginia in the fall usually furnish from 1 to 3 cases of typhoid fever in each year, all appearing within a fortnight after the railway journey, and apparently due to infection contracted en route. "The remedy lies in the retention closet. A good dry-earth closet would suffice and could be used on every train. It would prevent soiling the roadbed and be inoffensive."

Cerebrospinal Meningitis and Its Specific Cause.—Bettancourt and Franca² give an account of an epidemic of cerebrospinal meningitis which occurred in Portugal in 1903 and amounted to nearly 3000 cases. The clinical and bacteriologic aspects are fully treated, and confirm previous observers as to *B. intracellularis meningitidis* being the immediate cause, although they failed to infect lower animals with it.

Notifiable Diseases in Germany.—According to the Law of June 30, 1900,³ the following diseases are subject to notification throughout the German empire: (1) Any case of, and death resulting from, leprosy, Asiatic cholera, petechial fever, yellow fever, bubonic plague, and small-pox, and any case which arouses suspicion of one of these diseases, must be reported immediately to the police authorities of the place where the patient is residing, or, in case of death, has died. (2) Those required to give notice are: (a) The attending physician; (b) the head of the household; (c) any one who has attended or nursed the patient; (d) the person in whose dwelling the case of sickness or death has occurred; (e) the coroner. Those named under b, c, d, and e are only bound to give notice if the attending physician is not at hand. (3) In cases of illness and death in public institutions, hospitals, etc., the superintendent only, or one specially appointed for the purpose, is bound to give notice. These directions relative to notification may be extended to other diseases than those mentioned in § 1.

DISINFECTION.

Disinfection with Formalin.—Sembritzky⁴ recommends formalin in the form of pastils slowly vaporized over a formalin lamp, to inhibit germ growth and to destroy the foul odor of waiting-rooms, sick-rooms, bedrooms, and nurseries. If the flame is turned low, no discomfort is caused. It should be turned so low that only one pastil is vaporized in a night. The author recommends its use in cases of whooping-cough, and records similar experiences by Jedzik⁵ and by Lamallerec.⁶ The

¹ Med. Rec., Dec. 19, 1903.

² Zeit. f. Hyg. u. Infectiouskr. 46, pt. 3.

³ Information transmitted to the Louisiana Purchase Exposition by the Imperial Board of Health of Germany, July, 1904.

⁴ Therap. Monatshefte, Nov., 1903.

⁵ Zeitung der böhmischen Aerzte, Sept., 1901.

⁶ Revue mensuelle des Maladies de l'Enfance, Feb., 1902.

patient's room should be exchanged every day and the one not used should be well aired. See also Bonhoff.¹

Bromin as a disinfectant is highly recommended by Schumburg² in a strength of 0.8 : 1000 for the destruction of cholera and typhoid bacilli.

The Disinfection of Dwellings.—Kister and Matthes³ call attention to the increasing use of formalin, which, whether employed as vapor or spray, is gradually taking a very prominent place among the disinfectants available for use in dwelling-houses. In those cases in which it becomes necessary to undertake a very searching and complete disinfection, the use of a fluid medium, with which all exposed surfaces can be saturated, and which can be forced into all chinks and crevices, is greatly to be preferred, and hence, in addition to treatment with vapor or solution of formic aldehyd, some mechanic process of scouring with hard brushes, or rubbing down with bread, is resorted to. In the case of floors and painted surfaces, the employment of abundant scrubbing with soft soap and dilute carbolic acid is also needful. As a valuable aid to internal disinfection, the authors explain the construction and use of the portable apparatus invented by Zorn, and they give the results of certain practical tests carried out in two of the rooms of the Hygienic Institute of Hamburg, one of which was treated in the ordinary way, and one of which was disinfected by means of the above apparatus. The test-substances employed were in each case as follows: *Staphylococcus pyogenes aureus*, *Bacterium coli*, *Bacillus diphtheriæ*, tuberculous sputum, and spores of highly resistant potato-bacillus. The rooms were of nearly equal size, and while the one dealt with on the old system needed the work of 3 men for 2 hours and 35 minutes, the disinfection of the other room by means of the new apparatus took the same staff only 25 minutes, and involved the use of a smaller quantity of carbolic acid solution. In the former case 87.5 % of the germs were destroyed, and in the latter 88.2 %, but the saving in time was very considerable.

Disinfecting Power of Hot Soda Solutions.—Simon⁴ sought to ascertain how far common washing soda could be used for the disinfection of dwelling-houses. The tests were directed to find out the action of hot solutions of soda of various strengths upon the pathogenic organisms usually encountered in dwellings, such, for example, as the diphtheria bacillus, the different kinds of cocci, and tuberculous sputum. Experiments were made with threads dipped in bouillon cultures of these germs, also with polished surfaces of furniture, flooring, brushes, combs, kitchen utensils, etc. The author concludes that, even in dilute hot solutions, such as are employed in the laundry, soda is a safe and reliable disinfectant, and is also extremely cheap.

Inefficiency of Ferrous Sulfate as an Antiseptic.—McLaughlin,⁵ after a series of experiments with ferrous sulfate (copperas), presents

¹ Ueber einige neuere Untersuchungen auf dem Gebiete der Formaldehyddesinfektion, Berl. klin. Woch., May 9, 1904.

² Wien. med. Woch., Dec. 26, 1903.

³ Gesundheits-Ingenieur, Mar. 10, 1903.

⁴ Zeit. f. Hyg., etc., 43, 1903, p. 348.

⁵ Bulletin No. 15, Hygienic Laboratory, Washington, D. C., July, 1903.

the following conclusions: Iron sulfate does not show any restraining influence over the development of putrefactive changes unless it constitutes more than 2 % of the mixture. It does not permanently restrain the development of putrefactive changes unless it constitutes at least 5 % of the mixture. As a germicide it has little or no action, even when applied under the most favorable conditions for disinfection. When the material to be disinfected was flooded with the agent in saturated solution, in nearly all experiments its action was not apparent, and it failed to disinfect, under such favorable conditions, 7 different varieties of pathogenic organisms out of 9, after an exposure of 1 hour to a saturated solution. Tested upon feces it failed to disinfect after 3 days, although intimately mixed with the feces, and when it was applied in saturated solution, and in double the bulk of the material to be disinfected. It seems, therefore, that copperas or iron sulfate is of no real value as a disinfectant. The strongest solution has either no disinfectant action at all, or its disinfectant action is so slow and uncertain that its demonstration might be a matter of interest, but could not be of practical value.

Disinfection in Typhoid Fever and Dysentery.—The Imperial Board of Health of Germany¹ recommends the following disinfectants for use in typhoid fever and dysentery: (1) *Diluted cresol water*: This is made by stirring 1 pint (by weight) of solution of cresol soap into 19 parts by weight of water. Excrement, vomitus, and urine can be disinfected by mixing with this diluted cresol water, equal parts of each. The mixture must stand at least an hour before it is poured away. (2) *Fluid slaked lime*: One part of caustic lime and 4 parts of water. Put the lime in a vessel and sprinkle the water upon it gradually while constantly stirring it (the usual mode of preparing whitewash). If not for immediate use, it should be kept in an antiseptic vessel and shaken up when it is used. Excrement, etc., should be thoroughly mixed with equal parts of this fluid and allowed to stand an hour. (3) *Calcium chlorid*: This is effectual only when freshly prepared and kept in air-tight vessels. Two heaping tablespoonfuls should be added in powder to each $\frac{1}{2}$ liter of excrement, urine, etc., and well stirred with a stick. Fluid matter thus treated can be poured away in 20 minutes. For a full bath, 4 heaping tablespoonfuls may be stirred into the water, and the water allowed to stand half an hour.

Danger of Disinfection by Means of Corrosive Sublimate.—Bertarelli² discusses the views of Esmarch, Möerner, Sjöqwist, Krupin, and Bordoni-Uffreduzzi upon this subject, and gives the results of careful experiments which he had himself conducted at Turin. As the general result of his observations he states that this substance may be employed with the utmost confidence for disinfection, and that, with proper precaution, such as is always enjoined, even the officials who are constantly engaged in the work run no risks of mercurial poisoning.

¹ Publications of the German Government furnished to the Louisiana Purchase Exposition, July 18, 1904.

² Zeit. f. Hyg., xlii, p. 553.

Disinfection with Formaldehyd after Esmarch's Method.—Kiste and Trautmann¹ experimented to find a method of disinfection suitable for leather, furs, and similar perishable objects. In some previous experiments by Esmarch it was found that steam, heated to 103° to 104° C., impregnated with formalin, was more effectual than steam or formalin alone. The steam gives the penetrating power which the formalin lacks. Arguing from this, it was thought that steam produced at a lower pressure than the atmosphere, and at about 80° C. or less, impregnated with formalin, would be useful for disinfecting this class of objects. The results were unsatisfactory, and further experiments with a different apparatus will be made.

Intoxicant Action of Formalin.—Riggio's² conclusions from his various groups of experimental researches are to the effect that formalin is a poison which induces intense hyperemia in the organs by which it is probably eliminated. This occurs both when the poison is administered subcutaneously or by inhalation. The hyperemia is so intense that it induces hemorrhages in the liver, kidneys, and lungs. The formalin has also a destructive action on the cells of these organs, as he shows in detail.

The Bactericidal and Growth-retarding Properties of the Alcohols.—Wirgin³ concludes, from experiments on different alcohols: (a) That as regards their disinfecting qualities, the alcohols range themselves according to their molecular weights, methyl alcohol being the weakest and amyl the strongest. The tertiary alcohols are exceptions to the rule. Tertiary butyl alcohol acts more weakly than propyl, and tertiary amyl alcohol weaker than the butyl alcohols. (b) The isomeric normal, and iso-alcohols of the propyl and butyl series, approach one another in their disinfecting power. (c) The ability of alcohols to dissolve the red blood-corpuscles of rabbits varies with their molecular weights. (d) On dried microorganisms the methyl series acts best in a watery solution of 60 % to 70 %; in the ethyl series in a 60 %; and in the propyl series in a 30 %. (e) All the alcohol mixtures act better than a 1 % solution of carbolic acid, and approach more nearly to the power of a 3 % solution. (f) None of the alcohols destroy spores at the ordinary room-temperature. (g) All absolute alcohols are almost inactive toward dried microorganisms. The same applies to the highest concentrations of the watery solutions. (h) On damp microorganisms the highest concentrations of the watery solutions of the alcohols appear to act as strongly as the medium concentrations. (i) The most active alcohol mixtures surpass considerably some of the weaker antiseptics, such as boric acid 4 %, borax 4 %, potas. chlor. 4 %, pb. acet. 2 %, zn. sulph. 2 %, cupr. sulph. 2 %. (j) Under certain conditions (on pyogenic organisms dried in serum) the alcohols have stronger disinfecting power than hyd. perch. 2 % and formalin sol. 5 %, which circumstances depend on the greater penetrating power of the alcohols. Under the conditions mentioned they approach in power a 2.5 % solution

¹ Zeit. f. Hyg. u. Infectiönskr., 46, pt. 3.

² Riforma Medica, xx, 123.

³ Zeit. f. Hyg. u. Infectiönskr., 46, 1.

of cresol, a 1 % of iodine trichloride, and a 5 % of carbolic acid, without, however, reaching the disinfecting power of the last-named solution.

MUNICIPAL HYGIENE.

Improvement in the Disposal of Municipal Waste.—Morse¹ presents the following summary of progress in waste disposal. The cause of the rapid progress in Great Britain in the last few years is the high temperature attained by the introduction of powerful currents of steam or heated air under the ashpits of the furnace. It took nearly 17 years of progressive work to bring the temperature to the point of securing complete combustion without the emission of fumes and odors. In 1887 the temperatures ranged from 500° to 750°. In 1902, at Walker-on-Tyne, a temperature of 3000° was attained by a Meldrum destructor. The second important improvement was the use of steam boilers of large capacity in direct connection with the destructor, which used all the heat generated. A report of 1896-97 showed that 1 to 1½ pounds of water was evaporated for every pound of waste consumed. Later reports show that 1.95 pounds of water were evaporated for each pound of mixed town refuse consumed. The steam power thus developed has been widely utilized by English cities and towns in the past five years, having been applied as auxiliary in the production of electric power in at least 63 cities; and in connection with sewage-pumping works in about 40 towns. In some the water-supply has been pumped by the aid of the power derived from cremating the town refuse. To sum up, in 180 places in Great Britain where destructors are installed, over 100 are combined with electric or sewage-pumping plants. There are no reasons why the best forms of English destructors are not adapted to similar uses in this country. English municipal waste contains a larger proportion of ashes, clinkers, and cinders, a smaller proportion of garbage containing moisture, and a less amount of combustible refuse than American city waste; but, on the other hand, American municipal waste, although it contains a larger proportion of garbage, which causes a higher percentage of moisture than the English, yet has an ash collection which contains from 17 % to 25 % of unburned coal, and has also a refuse or rubbish collection which is three times as great as that of English towns.

Street-car Sanitation.—Soper² draws a sorry picture of the sanitary condition of the "30 lines of horse-cars on Manhattan Island" and of the elevated railway cars and stations. A committee of the Merchants' Association had taken up the question with a view to reform. In brief, they recommended more cars upon the surface lines; the disuse of sand, which is largely used in lieu of spittoons; provision of more cuspidors for elevated railway stations; prohibition of spitting from the cars into the streets; better sanitary care of the stations; more thorough and frequent cleansing of the cars; abolition of cocoa mats, and other objec-

¹ Journal of the Franklin Institute, June, 1904, p. 420.

² Med. News, April 9, 1904.

tionable floor coverings; regular inspection and cleaning of catch-pans under the tracks; better care of toilet-rooms; better ventilation and heating of the stations; as well as of the cars of the elevated road; provision of shelters for the public at the transfer stations.

Relation of Street Pavements to Health of Cities.—Richardson¹ has presented the following data relative to the effects of good street paving on the health of the people:

	Death-rate,
Berlin, almost all asphalt pavements.....	19.6
Amsterdam, stone and asphalt, streets washed.....	20.0
Rome, streets well cleaned, much asphalt, hard climate.....	21.2
Vienna, little asphalt, much stone and macadam.....	24.3
Dublin, granite, cobble, and macadam, fairly cleaned.....	29.3
St. Petersburg, cobble and macadam, cold climate.....	30.0
New York, 1892, little asphalt.....	38.37
“ 1894, more asphalt	30.0
“ 1896, more asphalt and clean streets because easily cleaned	26.0

Location of Cemeteries.—Bigot² discusses the proper location of cemeteries and the effect of different soils upon the question of selection of proper sites, illustrating by improper locations at Armentières and Vézelay. The principal danger to be avoided is the pollution of neighboring water-supplies. In one instance it was shown by means of fluorescein that the effluent from a cemetery filtered through a stratum of loose gravel with a rapidity of 150 meters per hour. Quotations are also cited from Gosselet³ and de La Forest⁴ in support of the principle.

Sanitary Aspect of Earth-burial.—The question of whether cemeteries are likely to cause injury to the health of those who may reside in their vicinity has already been considered and discussed from many different points of view, but the advocates of cremation have recently revived the opposition to the practice of earth-burial. Among the chief objections alleged against burial are the possible pollution of the subsoil water caused by the products of putrefaction, and the dangers which might arise to public health by the dissemination in this way of micro-organisms known to be the active agents in the spread of various diseases. Matthes⁵ cites the opinions of previous writers who have investigated this subject, and briefly indicates the results of their experiments, with a description of the nature of the tests undertaken in each case. The main point to which attention is herein directed as a likely source of trouble is the fear that the subsoil water may become infected with the soluble substances due to the decomposition of the animal tissues of the decaying corpses, as among these are the highly poisonous matters included in the group of ptomains and toxins. An account is then given of very numerous experiments conducted during a long series of years at the Hamburg Cemetery, where about 260,000 inter-

¹ Boston M. and S. Jour., Aug. 2, 1900, p. 107.

² Jour. de Méd. de Paris, May 29, 1904.

³ Am. Soc. Geol. Nord., 1, xxiii, p. 139.

⁴ Choix de l'emplacement des-cimetière, Bull. Soc. Belge Géologie, 1, xvii, 1903; Procès-verbaux, p. 112-118.

⁵ Zeit. f. Hyg. xlv, 1903, p. 439

ments have taken place on a very restricted area, a plan of which is appended. The results of the chemic and bacteriologic tests are set forth in numerous tables, and the author states that during the period under observation, while the burials were taking place at the rate of 12,000 per annum, no augmentation was noticed in the amount of impurity present in the subsoil water. His investigations have proved, moreover, that in suitable soil, properly drained to a depth of not less than 18 inches below the bottoms of the graves, no substances which from their chemic or bacteriologic properties were likely to be injurious to health are to be found in the effluent from the subsoil drains. The filtering effect, and the power of absorption possessed by the surrounding earth, suffice to eliminate all deleterious products.

Snow-removal by Means of the Town Sewers.—In lieu of the costly plan of carting away the snow from the street-surfaces to the river or to the depot, it has now become a usual practice to throw the snow, as fast as it is collected, into the sewers, and this is done either by employing specially provided openings, or by making use of the existing manholes and gullies. From observations conducted by Forbát-Fischer,¹ it would seem that even with an air-temperature outside of from 7° to 14° F., during periods of severe frost, the temperature of the sewer-water never falls lower than from 46° to 50°, which suffices to melt any reasonable quantity of snow, if proper precautions are taken to mix it gradually with the water in the sewers. An account is given of the arrangements made in Bremen, Cologne, and Frankfort-on-Main for the admission of the snow into the sewers, and details are appended of the snow-pits or shafts, which have been specially provided. In some cases a jet of water is employed to aid in carrying away the snow. There are now of these special snow-chambers 17 in use in Cologne and 8 in Frankfort, and similar arrangements are introduced in connection with the sewers of Aachen, Halle, and Wiesbaden. It has not been found that the solid matters and mud mixed with the snow, when the same is taken off the roadway in a partially melted state, cause any notable deposits in the sewers, but in order to make this system of snow-removal a success, it is expedient that the volume of water in the sewers should be relatively large. Attention is directed to the importance of making due provision for dealing with heavy snowfalls, in new schemes for the sewerage of towns, by the inclusion of a sufficient number of conveniently placed shafts, or snow-pits, with facility of access for carts, etc.

Agricultural Use of House Refuse.—Wilsing² states that if it be assumed that the cost of the removal and transport of the domestic refuse must be undertaken by the municipal authority, its value, from the agricultural point of view, is greatly enhanced. Allowing for the charge (taken at one shilling per ton of refuse) for spreading, gathering, and digging in to a greater depth those portions of the material which are unsuitable for the use of the farmer, he can well afford to pay 1s. 9d. per ton for the entire bulk, and he could therefore be charged 9d. per

¹ Gesundheits-Ingenieur, Oct. 20, 1903, p. 469.

² Gesundheits-Ingenieur, Oct. 10, 1903, p. 449

ton delivered. The approximate manurial value of one ton of ordinary house-refuse on the farm may range from 1s. 2d. to 4s. 2d., according to Röhreke. Some figures are given to show the cost of dealing with the refuse of the town of Bromberg. The expense of the collection is set down at £3,034 per annum, and the total bulk, taken at 166 loads of 2 cubic meters (70.62 cubic feet) each per week, amounts to 17,264 cubic meters, say, in round figures, 20,000 cubic meters per annum. The space needed each week for storing this quantity of refuse would be, roughly, 4300 square feet, or an area approximately of 5 acres for one year, at a mean depth of 3 feet 3 inches. Making an allowance for the two years of storage needed for preparation, and providing space for access and roadways, the area of land required for this bulk of material is assumed to be 9.29 acres. Sundry charges are estimated for turning over the heaps, adding lime and sand, and putting the compost on to the land. It is calculated that, all costs included, the 20,000 cubic meters would work out at £950. The expense of handling the refuse in this manner is compared with the cost of destructors and furnace-treatment, and it is stated that it is more profitable to make compost as described than to dispose of the refuse in any other way, in all those cases in which it is not possible to get rid of the material on the spot.

INDUSTRIAL HYGIENE.

Industrial Diseases.—Whitelegge¹ reports upon the cases of lead poisoning, phosphorus poisoning, arsenic and mercurial poisoning, and of anthrax in different industries in England in 1903. Under the operation of the recent act requiring the notification of these forms of disease, it appears that the cases of lead poisoning have been reduced from 1258 in 1899 to 614 in 1903, or less than half as many. Of these cases, 37 occurred among smelters of metals, 13 among printers, 24 among file-cutters, 18 in tinning and enameling workers, 109 in white-lead workers, 97 in china and earthenware workers, 28 in makers of electric accumulators, 39 among paint and color workers, 74 in coach-makers, 24 in ship-building, and 151 in other industries. There were also 5 cases of industrial arsenical poisoning, 5 of mercurial poisoning, and 47 of anthrax. A summary of the cases of anthrax is given for the five years 1899–1903. The whole number of reported cases was 211, most of which were among workmen in wool, horsehair, hides, and skins. The situation of the pustule in the persons attacked was upon the neck in 84, on the cheek in 31, the forehead in 14, the forearm in 16, the upper eyelid in 12, the angle of the jaw in 8.

The Hookworm Disease and Miner's Anemia.—Wainwright and Nichols² examined the stools of 400 American anthracite miners in different parts of the coal regions, and found the hookworm ova in only one instance. The writers point out that there is danger of more general

¹ Annual Report of the Chief Inspector of Factories and Workshops for the year 1903, London, June, 1904, p. 264.

² Med. News, p. 785, April 23, 1904.

infection in the mining regions. If it becomes widespread, it has a marked influence in diminishing the earning power of the miner and in reducing his average length of life. The only way to keep the disease out is by rigid inspection of workers and examination of the stools of all newcomers. Stiles has already shown that a large number of cases existed in the southeastern portion of the United States.

Visual Requirements of Railway Engineers.—Young,¹ after observations involving thousands of miles of railway travel in an engine cab, concludes that engineers should not be rejected for slight defects in vision which may be corrected by glasses. Since "the average man does not become an engineer much under forty," he concludes that "if glasses are prohibited, the life of an engineer may thus become so short that men will hardly deem it worth while to serve the apprenticeship."

Lead Poisoning in White-lead Factories.—Ogg² gives his experience in the study of white-lead workers. He finds a varying susceptibility to poisoning among them. Cases of immunity are usually in the well-developed, healthy, and temperate workers who recognize the value of precautionary measures. Impaired nutrition plays an important part in the development of lead poisoning. Epilepsy is a frequent disorder among the workers. The most dangerous parts of the works are the drying chambers. Respirators should be provided and the workmen required to wear them. Smoking is prohibited, but chewing allows large quantities of lead to gain access to the digestive system and is hard to detect. Frequent medical examinations of workers should be made to detect early manifestations of lead poisoning.

Lead Poisoning among House Painters.—A proposed schedule of regulations has been submitted to the German government "for the prevention of lead diseases among house-painters, decorators, and varnishers."³ These regulations are to be binding on all employees in these trades, as well as in all industrial establishments where such persons are employed in connection with other industries. The regulations do not forbid the use of white lead, but contain detailed instructions for avoiding the dangers connected with the manipulation of lead colors mixed with oil or varnish, as well as with the process of rubbing or breaking away dry coats of lead color. Medical supervision and the keeping of a special health book are to be obligatory, and each workman is to receive a leaflet enlightening him on the dangers with the trade and the best methods of escaping them.

The Theatrical Profession as a Factor in Disseminating Disease.—Brown⁴ concludes: (1) That the theatrical profession is a factor of great importance in the dissemination of scabies, pediculosis, syphilis, and gonorrhea, by means of its peculiar sociologic position. (2) That this influence is greater in traveling troupes than in companies located permanently in large cities, on account of the lack of accommodations and unhygienic conditions in which they live. (3) Living apart from the rest of the world as they do to a great extent, they are deprived of the

¹ Ann. of Ophthal., Jan., 1904.

² Lancet, London, Jan. 2, 1904.

³ Public Health, Aug., 1904, p. 675.

⁴ Med. News, N. Y., Mar. 19, 1904.

medical education which is becoming so popular with the rest of the laity. (4) Lack of time prevents the members of this profession from consulting medical men in the large cities except when physically incapacitated, and in consequence they fall into the hands of unscrupulous and ignorant physicians or charlatans.

Tuberculous Infection among Slaughter-house Workmen.—

Lassar¹ has investigated the frequency of local tuberculosis of the hands among those engaged in slaughter-houses and found over 2% affected. In one case a man had tuberculous warts on the fingers and inoculated his body by scratching. Lassar concludes that tuberculous beef has contagious properties for the skin, and that Koch's contention that bovine tuberculosis is not pathogenic for man is incorrect.

Caisson Illness and Diver's Palsy. Modes of Prevention.—

Hill and Macleod² report the results of experiments and observations relative to this form of illness. They believe that by proper choice of men (healthy young men, 18 to 26 years old, and not too stout) and regulation of the shift and decompression period, work can be carried out without loss of life at a depth of even 200 feet, *i. e.*, about 7 atmospheres, or + 100 pounds pressure. They also conclude: that the circulation is unaffected mechanically by compressed air, that the cause of caisson disease is the escape of gas bubbles in the bloodvessels, and tissue fluids on decompression. An animal exposed 4 hours to 8 atmospheres of air and quickly decompressed is like an opened bottle of soda-water. The fluids of the body generally effervesce. Recompression causes the bubbles to go into solution, and if applied quickly enough the circulation recommences. The varying symptoms of caisson-sickness are due to the varying seat of the air emboli. Young men escape caisson sickness owing to the elasticity of their tissues, and greater facility for collateral pathways of circulation. Animals can be safely exposed to 8 atmospheres of air for 4 hours, if 2 hours be spent in gradual decompression. Such exposure can be safely repeated 3 times a week. By the choice of suitable men, and proper regulation of the period of compression and decompression, caisson illness can be avoided.

SCHOOL HYGIENE.

Effects of Excessive Voluntary Employments out of School-hours upon Scholars in the Higher Grades of Schools.—Krollick³ presents diagrams showing the parallelism between the percentage of scholars occupied with extra employments out of school-hours (music, languages, child labor, etc.) and the ratio of illness of all kinds, nervous diseases, headache, nosebleed, and insomnia. These percentages generally increase from the lower ages and grades to the upper. To these occupations may be added the injurious effects of alcohol, coffee, and tobacco, which assert themselves in increasing ratio with the school ages.

Scarlet Fever; Quarantine Period.—The length of time during

¹ Dermatol. Zeitschrift, 10, 5, 1904.

² Jour. of Hyg., iii, No. 4, Oct., 1903.

³ Enzyklopädisches Handbuch der Schulhygiene, Wien and Leipzig, 1904, pp. 406, 407.

which children are excluded from school in scarlet fever is stated by Wehmer¹ as 6 weeks in most German States, 40 days in France and Belgium, and 8 weeks in Denmark.

Medical Inspection of Schools.—MacMurchy² presents an excellent condensed summary of progress in medical inspection of schools in different countries, and gives the following conclusions as to the duties of inspectors: (1) Prevent children, as far as possible, from being exposed to communicable diseases at school. (2) Help children with defective sight or hearing to profit by the education the State is giving them. *Sight:* Out of 17,245 children examined in London schools in 1902, 8 % of the boys were found to have serious visual defects and 11 % of the girls. *Hearing:* Out of 600 children examined in Glasgow by Barr, 166 were found defective in hearing. Out of 5000 examined by Weil in Stuttgart, 30 % were found to be defective in hearing. Sexton, of New York, examined 570 children and found 76 with defective hearing. Of these 76, only one was known by the teacher to be defective, and only 10 knew themselves to be deficient in this sense. (3) Pay proper attention to the physical condition of the children. Why promote growing children to higher grades, when their bodies are unfit for higher grades?

Instruction in Regard to Sexual Diseases.—Schusny,³ of Budapesth, stated that, in the Hungarian schools, teachers of physiology alluded to sexual questions in addressing the older boys, advising them on sexual hygiene and in regard to the dangers of venereal disease. He advocated that parents should inform their children as they approached puberty, and said that for the last ten years he had delivered addresses along this line to the older boys just before they left school.

Stuttering and Stammering among School-children.—Gutzmann⁴ reported the statistics collected by school medical inspectors. The proportion of stutterers out of 3000 examined was for children under 7 years only 6 %, increasing to 10 % at 7 years, and 15 % at 11 to 12 years. On the other hand, stammering decreased as education progressed, the proportion being 29 % under 7 years and only 6 % at 13 to 14 years. (See also observations of E. M. Hartwell⁵ on pupils in Boston schools.)

Physical Development of London School Boys and Girls.—Thorne and Berry⁶ report upon the physical development of 1890 boys and 1580 girls in London schools. The ages of the boys varied from 9 to 16 years. Of these, 969, or 51 %, were 12 years old. Their height varied from 4 feet 2½ inches to 5 feet 6½ inches. Their weights varied from 56 pounds to 112 pounds. *Chest expansion:* 22 had one inch only; 348, 2 inches; 880, 3 inches; 363, 4 inches; 25, 5 inches; and one, 6 inches. Out of 1438 boys examined, 90 had definite cardiac disease; there was mitral regurgi-

¹ Enzyklopädisches Handbuch der Schulhygiene, 1904, p. 542.

² Amer. Med., May 21, 1904.

³ Int. Congress of School Hygiene at Nuremberg, April, 1904; Jour. Am. Med. Assoc., May 7, 1904.

⁴ Int. Congress of School Hygiene, April, 1904.

⁵ Special Report, School Document No. 8, 1894, p. 82.

⁶ Brit. Med. Jour., April 9 and May 28, 1904.

tation in 43 cases. In 85 cases out of 90 the boys were not aware of any cardiac lesion. One boy had signs of consolidation at apex of lungs, and was sent to a convalescent home, and was returned well in 6 months. Twelve had bronchitis, but not serious. There were 3 cases of spinal disease, lateral curvatures. In 49 the color sense was defective. In 439 vision was below standard; 292 wore glasses; enlarged tonsils, adenoids, or both were found in 633. There was defective hearing in 333, or 17.6 %. Albumin was found in the urine of 172, but in 127 of these it was only a trace or very slight in amount. Of the girls examined, the height varied from 4 feet 7 inches to 5 feet 2 inches, a very few being above and below these figures. Their weights varied from 70 to 106 pounds. The following tables present comparative figures from different sources, centimeters and kilograms being used for the sake of convenience in comparison:

AVERAGE HEIGHT (IN CENTIMETERS) OF SCHOOL-GIRLS AT DIFFERENT AGES.

Ages.	London Schools.	Quetelet. (Brussels).	Bowditch. (Boston.)	Paglioni. (Turin.)	Sweden.	Denmark.
11	139.7	130.1	135.7	131.5	137.0	133.0
12	144.9	135.2	141.9	136.7	143.0	138.0
13	147.4	140.0	147.7	142.6	148.0	146.0
14	156.2	144.6	152.3	149.6	153.0	151.0
15	157.4	148.8	155.2	152.6	157.0	154.0

AVERAGE WEIGHT (IN KILOGRAMS) OF SCHOOL-GIRLS.

Ages.	London.	Quetelet.	Bowditch.	Paglioni.	Sweden.	Denmark.
11	31.7	25.5	31.2	26.9	31.9	30.5
12	34.8	29.0	35.5	29.5	35.9	34.0
13	38.2	32.5	40.2	34.5	39.6	38.0
14	44.9	36.3	44.6	38.5	44.8	42.0
15	48.0	40.0	48.1	43.8	48.9	46.5

Chest expansion: 53 % had an expansion of from 2 to 3 inches; 36 % from 3 to 4 inches, and only 1 % exceeded 5 inches. There were no serious cases of lung disease among the girls. Thirteen presented cardiac murmurs indicative of organic heart disease. Anemia was present in many cases, but slight in character. Curvature of the spine was present in 12 % of the girls in some degree, a fact which calls for more attention to the physical education of girls than is now given in elementary schools. There was no case of color-blindness among the girls. Nearly 13 % had errors of refraction requiring the use of glasses, and less than half of these were provided with glasses. In 8.3 % there was defective hearing, mostly slight in character. The urine of most of the girls was examined, and albumin was found in nearly 10 %. The majority of these were

girls of good general appearance, and in no case was any history of kidney disease given, and in none had the existence of kidney trouble been suspected. Upon this point the observer makes the following conclusions: (1) In the majority of cases in which albuminuria was found the condition was not merely accidental and transitory, but was more or less persistent, at any rate for a few years. (2) I find no evidence of consequent deterioration of health, so far as I have been able to watch the cases. (3) On the whole, the albuminuria tends to diminish, and in more than half the cases had disappeared when they were last seen.

Prevention of Infectious Diseases in Italian Schools.¹—By means of a new set of regulations the Italian Government has recently divided infectious diseases into two classes for school purposes, chronic and acute. Among the former are placed trachoma, ringworm, itch, impetigo, alopecia areata, and certain forms of tuberculosis affecting the skin, the bones, etc. Children suffering from such diseases are allowed to attend school, subject to the condition of presenting a medical certificate every fortnight and occupying separate benches at school. Children suffering from acute diseases are not allowed to attend school. In this class pulmonary phthisis is included. In notifying contagious diseases among children physicians are required to state whether the child is attending any school. If there are in the household any school-children, or tutors or governesses employed in a school, this must be stated and such persons are forbidden to enter any schools.

Medical Inspection of New York Schools.—Emerson² presents the following figures for the schools of New York city:

Visits to the public schools by medical inspectors in 1903...	21,738
Visits to parochial schools and kindergartens	7,563
Examinations made in public schools during the year .. over 3,000,000	
Examinations made in parochial schools and kindergartens ..	500,000
Exclusions from the public schools	17,552
Exclusions from parochial schools and kindergartens	2,583

DISEASES FOR WHICH CHILDREN WERE EXCLUDED.

	Public schools.	Parochial schools and kindergartens.
Head (including 80 % pediculosis)	9307	1447
Eye	5502	937
Skin	865	162
Mumps	501	13
Chicken-pox	160	16
Whooping-cough	110	4
Measles	64	4
Scarlet fever	9	—
Diphtheria	7	—

The teachers are unanimous in declaring the physical condition of the pupils to be greatly improved since the establishment of the system.

Exclusion of Scholars from School, Switzerland.—The regulations in force in Switzerland relative to the exclusion of scholars from school are not uniform in the different cantons. Wehmer³ gives the rules for

¹ Lancet, March 19, 1904.

² Brooklyn Med. Jour., May, 1904.

³ Enzyklop. Handbuch der Schulhygiene, 1904, p. 804.

the cantons of Bern, Basel, St. Gall, Vaud, Glarus, and Zurich. In Bern 6 weeks are required in scarlet fever; in diphtheria, 2 weeks after the disappearance of the membrane; in whooping-cough, until the cessation of the convulsive paroxysms; in measles, r  theln, chicken-pox, and mumps, 2 weeks from the beginning of the attack.

School Diseases, Classification.—Under this head Wehmer¹ makes three groups of diseases: (1) Actual diseases and lesions caused by school attendance. Under this group Wehmer includes lesions of the spine, of the eyes and ears, writer's cramp and often muscular lesions, anemia, nervous diseases, and certain diseases of the circulatory and digestive organs and of other organs of the special senses. (2) Infectious diseases. (3) Sudden accidents occurring among children at school.

Tuberculosis among School-teachers.—Le Gendre² believes that the vitiated air, over-exertion of the organs of speech and respiration, the fatigue from long confinement, and frequently insufficient nourishment combine to render teachers exceptionally susceptible to tuberculous infection. This danger is enhanced in school-rooms by dust constantly stirred up in the air and brought in from the street, and the large number of persons in the room, and still further by the common use of many articles, pencils, erasers, pens, etc., and by the moistening of the finger with which to turn the leaves of books. Prophylaxis should include reduction of the number of scholars in a room, better ventilation, prohibition of dry sweeping, and rejection of all candidates for positions who are already tuberculous. Children predisposed to tuberculosis should be sent to schools organized for the purpose in the country or at the seashore, and tuberculous teachers should be given the benefit of sanatorium treatment. [Among the persons admitted to the Massachusetts Sanatorium for Consumptives in the four years 1900 to 1903 were 22 teachers.]

WATER-SUPPLY AND SEWERAGE.

Nitrites in Drinking-water.—As the result of observations and analyses of different water-supplies, Dienert³ concludes: (1) That nitrites may be found in the subsoil independently of any contamination. (2) That contamination of water is not always accompanied by the formation of nitrites. (3) Certain precautions are necessary in examining for nitrites in water, since if the temperature is raised during the transportation of the sample, nitrites may be found, which did not exist in the water when it was collected. (4) Any opinion as to the quality of a sample of water should be made independently of knowledge as to the existence of nitrites.

Supervision of Water-supplies and Typhoid Fever.—Fuller⁴ gives

¹ Enzykl. Handbuch der Schulhygiene, 1904, p. 755.

² Int. Congress of School Hygiene at Nuremberg, 1904.

³ Rev. d'Hygi  ne, April, 1903, p. 301.

⁴ Jour. of Mass. Association of Boards of Health, vol. xiv, 1904, p. 12.

the following suggestive figures showing the death-rates from typhoid fever in the chief cities of two populous States, in one of which careful supervision of public water-supplies has been exercised by the State Board of Health for many years, and in the other no such supervision exists.

DEATHS PER 100,000 INHABITANTS FROM TYPHOID FEVER IN
CERTAIN CITIES FOR THE YEARS 1898-1900.

Massachusetts.		Pennsylvania.	
Boston	30	Pittsburg	108
New Bedford	30	Allegheny	86
Springfield	26	Johnstown	83
Lawrence	25	York	83
Taunton	25	Chester	64
Brockton	24	Lancaster	59
Chelsea	24	Philadelphia	54
Salem	23	McKeesport	53
Fitchburg	21	Reading	50
Lowell	21	Allentown	49
Lynn	20	Harrisburg	41
Newton	20	Altoona	33
Cambridge	18	Wilkesbarre	29
Worcester	18	Erie	28
Fall River	15	Seranton	23

Bacterium Coli as an Indicator of Fecal Pollution.—Petruschky and Pusch¹ controvert the views of Weissenfels, who had doubted the value of the bacterium coli test. The authors state that in highly polluted river-waters it is always present, and its relative abundance furnishes a good test of the degree of impurity. No increase occurred in the number of bacterium coli present in a slightly impure water, even when kept for a long time, if stored in an ice-chamber, and hence samples collected in winter can safely be dealt with, notwithstanding the interval that may have elapsed since they were procured. The methods of conducting titration tests for bacterium coli are described and the results of numerous experiments are set forth.

Sewage-farm Produce.—Long,² in the British House of Commons, in reply to an inquiry as to the possible danger arising from the use of vegetables and fruit grown upon sewage farms, said: "I have not received any representations from France, of fruit and vegetables grown upon sewage farms, and it appears to me that there would be considerable practical difficulty in identifying any produce so grown. I am advised that, speaking generally, vegetables and fruit grown upon sewage farms would not be unfit for food, though uncooked, unless they had been allowed to be in contact with the sewage, and I understand that one of the model regulations issued in France last year would forbid the disposal of matters from cesspools or sewers upon land on the surface of which are cultivated vegetables and fruit intended to be eaten uncooked."

Legal Control of Water-sheds for the Prevention of Pollution.—In a discussion³ at a meeting of the Medical Society of the County of

¹ Zeit. f. Hyg., xliii, p. 304.

² Sanitary Record, July 28, 1904, p. 87.

³ Med. Rec., May 28, 1904.

New York the following measures were proposed for the prevention of pollution of public water-supplies: (1) By the acquisition of pure lands to meet the needs of the situation. (2) To compel the tenants near the water-supplies to introduce proper systems for the disposal of their waste. (3) By combating constantly recurring nuisances. (4) By the installation of filtration plants. In Massachusetts these measures are practically secured at the present time under the provisions of an act which gives the State Board of Health power to make rules and regulations for the protection of water-supplies. After such rules have been adopted by the board, upon application from a water board or water company the local authority has power to enforce them.

FOOD AND DRUG INSPECTION.

Cereal Foods.—Gudeman,¹ after analyses and digestion experiments, finds that the amount of soluble material in raw cereals before digestion varied from 2 % to 8 %, in prepared cereals from 4 % to 23 %, and in malted cereals from 4 % to 60 %. Raw cereals should be cooked at least an hour to render them satisfactory as articles of diet. Raw cereals, if sufficiently cooked, are as quickly digested as the best malted cereals, more quickly than the prepared cereals and a large majority of the so-called malted cereals. "The only advantage the prepared and malted cereals have over the raw cereals is that they come to the consumer ready for immediate consumption. The claim that prepared cereals are predigested food applies only to the malted cereals, and only so far as part of the starch has been converted. The difference in the time of digestion, with saliva and pancreatin, between a well-boiled cereal and a fully malted prepared cereal is so small that the same can be ignored when determining the relative nutritive ratio, and factor of digestibility."

The Food Value of Sugar.—Snyder² gives the results of experiments with healthy workingmen with and without sugar. "The addition of 5 ounces of sugar daily to the ration proved beneficial. We increased the available energy of the ration 25 % and did not affect the digestibility of the other foods with which it was combined. The various nutrients were equally as digestible with as without the sugar. When sugar was added to the ration, the protein was more economically used, 25 % more nitrogen, one of the elements of protein, being retained in the body. The value of sugar in a ration depends on its judicious use and combination with other foods."

The Acid Contents of Bread.³—The results of 26 analyses of bread from 4 bakeries are given, in which the acid contents varied from 2 to 9 degrees.

Banana Flour.⁴—See also Neish on banana flour.⁵ A good banana flour to keep well contains 15 % of water.

¹ Jour. Am. Chem. Soc., 26, 1904, No. 3.

² Minnesota Station, Bulletin 86, p. 225.

³ Ztschr. Untersuch. Nahr. u. Genuss., 6, 1903, No. 21.

⁴ See Jour. Agric. Trop., 3, 1903, No. 28.

⁵ Jour. Jamaica Agric. Soc., 7, 1903, No. 11, pp. 439-441.

Breakfast Foods, Analysis of.—Weems and Ellis¹ make the following sensible comments, after careful examination of various breakfast and other advertised food preparations: "The breakfast foods are put up in an attractive form, and many of them are pleasing to the taste. The statements printed on these packages are greatly exaggerated, and little reliance can be placed in many of them. The cost of the prepared foods is 10 to 16 cents per pound and the unprepared 6 to 7 cents per pound. These products do not possess any nutritive value in excess of ordinary food materials. The attractive features are the packages and the palatableness of the food. The claims made for many of the pre-digested foods are of little or no value. The breakfast foods are not medicines, and no reliance should be placed in statements which claim that they are a remedy for disease." The foregoing statement is peculiarly applicable to those preparations which their makers pretend will "build up" the brain or supply it with additional power not supplied by ordinary articles of food.

Vinegar.—Popp² reports artificial digestion experiments with pepsin which showed that neither vinegar containing 2 % of acetic acid nor that containing 4 % had any effect upon digestibility. Vinegar with less than 2 % of acetic acid was not found to be a satisfactory preservative for meat for short periods, while that containing more than 2 % was satisfactory for this purpose.

Standard of Cider Vinegar.—Leach and Lythgoe³ state that it is rarely necessary to make a complete analysis to determine the purity of vinegar. "Aside from the determination of acidity and total solids, by far the most important tests consist in the polarization and in the calcium chlorid and lead acetate tests for malic acid. It is rare that spurious vinegar will fail of detection by at least one of these tests. Only in doubtful cases is it necessary to go farther. It is well, however, to be able in some cases to confirm one's judgment by added proof, and where litigation is involved a complete analysis may be helpful."

Adulteration of Food.—Winton, Bailey, and Silvermann,⁴ out of 40 samples of chocolate examined found that 11 were adulterated, 7 were mixtures marked "compound," and the remainder were genuine. Coffee: 17 samples of whole coffee and 29 of ground coffee were examined. All of the examples of whole coffee were genuine; 9 of the samples of ground coffee were adulterated, chicory being present in all. Some contained imitations made of wheat flour or pellets of pea hulls and other articles. Lard: 134 samples were examined; 4 of these were sold as "compound lard"; 48 % of the remainder were largely adulterated with cotton-seed oil. Of 882 samples of different articles of food, including butter, molasses, and vinegar, 98 were adulterated or below the standard.

Barnard⁵ reports upon 290 samples, of which 139 were adulterated. He discusses the composition of fruit juices and jellies, a class of food very largely adulterated.

¹ Iowa Station, Bulletin 74, pp. 101-114.

² Ztschr. Untersuch. Nahr. u. Genuss-mittel, 6, 1903.

³ Jour. Amer. Chem. Soc., 26, 1904, No. 4, pp. 375-382.

⁴ Eighth Connecticut Report on Food Products for 1903.

⁵ New Hampshire Bulletin, 1904, No. 3.

Food Regulations in New South Wales; Preservatives.—Sulfurous acid, not more than 1.75 grains, salicylic or benzoic acid, not more than 1 grain, and boric acid not more than 10 grains per pint of liquid, or pound of solid food. In the following foods none of these antiseptics may be used, except in the proportion of 0.001 grain per pound or pint: Milk, including condensed milk, cream, canned and bottled foods, juices and fruits, aerated waters and temperance drinks, fresh fish, vinegar, sauces and pickles. The use of sulfurous acid and boric acid is permitted for preserved fish, bacon and ham.

Sulfurous Acid as a Food-preservative.—Harrington¹ states that sulfurous acid and its salts are largely used for the preservation of fish, meat, sausages, fruits, juices, dried vegetables, cider, and wines; their action also produces an improvement in appearance suggestive of superior quality. Certain vegetables, such as corn and asparagus, are bleached to a uniform white, while meat acquires the redness of arterial blood. Harrington's observations were made upon Hamburg steak, which "is made in great part from trimmings and various inferior parts not otherwise saleable, which accumulate in the receptacles for waste in the meat stalls and naturally acquire an extensive bacterial flora. . . . The chief incentive to the use of this preservative is the fact that it . . . causes the meat to look invitingly fresh, even though the original material was stale, of bad appearance, and swarming with bacteria. It also masks the foul odors of decomposition. Thus, although apparently fresh to the eye and nose, the prepared mass may be well advanced in decay and teeming with bacteria." In the author's laboratory two portions of Hamburg steak, one treated with 0.2 % of sodium sulfite, and another untreated and kept in a refrigerator under similar conditions, gave striking results, the bacteria in the plain meat increasing from 610,000 per gram on the first day to 26,313,000 on the sixth day, and in the treated meat from 1,760,000 per gram to 3,483,000 in the same time. In Boston markets 50 samples examined contained quantities of sodium sulfite varying from 0.061 % to as high as 1.225 %. Experiments were made upon 6 cats by feeding for 20 weeks, "5 receiving 6 feedings weekly of meat containing 0.2 % of sodium sulfite, and the sixth receiving the same meat with no addition. The latter showed a constant gain to the end; the others gained until about the ninth week, and then began to lose ground, frequently refusing food or leaving it largely uneaten, but otherwise they showed no evidence of injury." Microscopic examination of the kidneys of these animals at the close of the experiment "in all but the control cat, showed marked (degenerative) changes."

The Use of Food Preservatives.—Eccles² vigorously attacks the recent laws and regulations which have been enacted in different States and countries to prevent or to limit the use of preservatives in food. The burden of his argument relates to the use of salicylic acid, which he considers, in quantities sufficient to preserve ordinary articles of food, as harmless as common salt. He quotes experiments of Dunham to show "that the use of salicylic acid is immensely safer than salt, so far as the

¹ Boston M. and S. Jour., May 26, 1904.

² Med. News, Feb. 13, 1904.

effects, power for power, are upon the consumers." He also says: "It is as senseless to condemn the use of salicylic acid, as diluted in food, as it would be to make a law forbidding any one from selling lemons to the public." He quotes figures from the experience of Brooklyn and New York and also from the United States census in support of his position. [The absurdity of some of these quotations is shown by the following, p. 308: "The death-rate of clergymen is 23.5 per 1000, and that of saloon-keepers only 13.3 per 1000." The fallacy in this statement consists in the fact that no account whatever has been taken of the ages of the classes compared with each other. The highest statistical authorities the world over, from Dr. Farr down to the present time, place clergymen at the head of the list, with farmers next, and saloon-keepers very near the bottom of the list, when the question of longevity of occupations is concerned.]

The Cooking of Shellfish.—The "British Medical Journal"¹ gives the results of a study of the cooking of shellfish by steam. If overcooked, the palatability of the food is lessened. There is less danger of overcooking by steam than by boiling. "There can be no doubt that if the retailers of cooked shellfish can be induced to substitute steaming for boiling—or rather for scalding—in the cooking of shellfish for sale, there will be a distinct gain in public safety."

Bakeries from a Hygienic Standpoint.—Emmerich² discusses existing conditions and the importance of hygienic measures in bakeries.

Nutrition.—Fletcher³ maintains that health may be preserved by eating a comparatively limited amount of food and taking pains to masticate it thoroughly, the normal appetite being a guide as to the kind and amount of food required. This volume contains an explanation of the author's theories, and quotations from different writers in support of his views.

Characteristics of Good Macaroni.—Shepard⁴ gives the following characteristics of good and poor macaroni: "A good macaroni will be white in color and retain its shape. When eaten, it will be tender and have a slightly sweetish taste, together with a peculiar nutty flavor, which is characteristic. A poor macaroni has a starchy, unpleasant taste, and the flavor is disagreeable. It may also be tough and leathery. If it has soured in curing, the disagreeable flavor will betray the fact."

Borax and Boric Acid as Preservatives.—A summary of data relative to these articles is given in "Zeitschr. Fleisch u. Milchhyg.," 14, 1904, and the general conclusion was drawn that these substances have not been shown to be harmful when used as food preservatives.

Anilin Dyes.—Chlopin⁵ reports the results of an elaborate study of the composition and effects on animal life of dyestuffs made from coal-tar. A considerable number were found to be harmful. The most of them belong to the niter, azo, and triphenyl groups. While these are named

¹ 1904, p. 265. ² Zeitschr. Untersuch. Nahr. u. Genuss., 7, 1904, No. 5, p. 299.

³ The A. B.-Z of Our Own Nutrition, New York, 1904.

⁴ So. Dakota Station, Bulletin 82, pp. 34-45.

⁵ Kamennougolnuiya. Kraski. Dorpat. k. Mattisen, 1903, p. 300.

as specially poisonous, the author maintains that all anilin dyes are more or less injurious to the animal organism, and that their use in food-products should be prohibited by law.

Quality of Condensed Milk.—Analyses of a large number of samples of condensed milk made by the analyst of the State Board of Health of Massachusetts during the seven years 1898 to 1904 showed a great variation in quality, although the chemist states that by far the majority appear to be honestly prepared. Some were evidently made from centrifugally skimmed milk. The worst sample contained only 0.09 % of fat, or cream. This sample was labeled the "Dewey" brand, and the label bore the statement "made from the purest milk in the country." It was short-lived, the manufacturers paying the usual penalty in court for adulteration. The analysis of other samples showed percentages of fat varying from as high as 12 down to nearly zero. The majority of the samples contained over 8 % of fat. The fat or cream in the original milk from which the condensed milk was made varied from as high as 6.5 % to nearly zero. The majority, however, contained over 3.5 %. The added cane-sugar varied from as high as 60.3 % to as little as 31.5 % of the whole.

Humane Methods of Slaughtering Animals.—The committee appointed "to ascertain the most humane and practicable methods of slaughtering animals for human food, and to investigate and report upon the existing slaughter-house system," has made its report.¹ The word "animals" in this report includes only cattle, calves, sheep, lambs, and pigs. The persons examined by the committee were the principal veterinary inspectors, master butchers, Jewish rabbis, and other local authorities. In general, the Jewish method of slaughter was condemned upon humanitarian grounds. The following general suggestions were made by the committee: (a) All animals must be stunned, without exception, or otherwise rendered unconscious, before blood is drawn. (b) Animals awaiting slaughter must be placed so that they cannot see into the slaughter-house, and the doors of the latter must be kept closed while slaughtering is going on. (c) The drainage of the slaughter-house must be so arranged that no blood or other refuse can flow within sight or smell of animals awaiting slaughter, and no such refuse shall be deposited in proximity to the waiting-pens. (d) If more animals than one are being slaughtered in one slaughter-house at the same time, they must not be within view of each other. (e) None but licensed men shall be employed in or about slaughter-houses.

Defects of Drug Legislation.—A correspondent,² in discussing the merits of drug legislation intended to regulate the sale of drugs, relates an instance of a grocer who had in his store a sugar barrel filled with empty $\frac{1}{8}$ -ounce morphin bottles, which represented the morphin which he had sold. He allowed his customers one cent each on returning the empty bottles. Another grocer sold a 2-ounce bottle of laudanum which was

¹ Report of the committee appointed to consider the humane slaughtering of animals, London, July 1, 1904.

² Amer. Med. April 23, 1904.

taken from a large stock container. Having no laudanum label, he placed a paregoric label on the package, drew a pencil-mark through the word "paregoric," and substituted the word "laudanum" in pencil, leaving printed directions for paregoric dosage, in this case the adult dose being from 1 to 4 teaspoonfuls. In another instance a small boy employed by a grocer sold an ounce of opium without question, weighed it upon a bare scale pan, and delivered it in a plain paper bag. At another place a person well known to the writer bought laudanum without question in a candy-shop, a grocery, and at a blacksmith-shop. "Is it any wonder," he adds, "that the drug-habit is on the increase under such conditions?"

Alcohol as a Stimulant.¹—Further interesting information regarding the action of alcohol as a stimulant was afforded by the so-called Marathon race recently held in Boston. The race involves a run of 25 miles. One of the contestants, a youth of 18, began to take raw brandy near the beginning of the race. He had four or more drinks in all, although he had never taken liquor before. The result was a condition of extreme exhaustion at the end of the race, with poor pulse, low temperature, and mental dulness. It was the opinion of the physicians in attendance that alcohol taken as a stimulant in such tests of strength and endurance acts rather as a poison than as a stimulant.

VITAL STATISTICS.

Notification of Infectious Diseases in Italy in 1903.—The following list embraces the total number of cases of infectious diseases notified to the health authorities in Italy in 1903² in a total population of 32,475,253:

Measles.....	112,191	Tuberculosis.....	6,680
Scarlet fever.....	14,103	Malaria.....	183,802
Smallpox.....	19,561	Syphilis.....	251
Typhoid fever.....	43,849	Rabies.....	89
Typhus fever.....	316	Malignant pustule.....	3,423
Diphtheria.....	17,820	Glanders.....	46
Puerperal fever.....	3,023		

Registration of Deaths in England.—Moore,³ in view of serious defects which still exist in the English Registration Acts, proposes decided reforms in death-registration involving the presentation of a certificate of death by a registered practitioner in every case of death, within 24 hours after death, or an alternative by another practitioner authorized by the attending physician to see the body and certify. Since no requirement has ever existed in England to register still-births, he also proposes legislation to include this class of deaths, with an appropriate fee in either instance. He defines the term "stillborn" as a "child that is born at a sufficiently advanced period of pregnancy to be viable, but which does not breathe or show any sign of life after it is completely born."

¹ Boston M. and S. Jour., May 12, 1904.

² Bollettino Sanitario dell' Anno 1903, Roma, 1904.

³ Brit. Med. Jour., Jan. 30, 1904.

Vital Statistics of England.—An advance sheet from the Registrar-General's office¹ gives the following statistics for 1903:

Enumerated population, 1901.....	32,527,843
Estimated population, 1903.....	33,378,338
Marriages	260,694. Rate, 7.81
Persons married.....	521,388. " 15.62
Births	947,949. " 28.40
Births of males.....	482,191
Births of females.....	465,758
Births of males to 1000 females.....	1035
Deaths	514,450
Death-rate	15.41
Birth-rate of London.....	28.37
Death-rate of London.....	15.19

QUARTERLY PERCENTAGES.

Quarter ended on last day of:

	March.	June.	Sept.	Dec.
Marriages	17.45	27.99	27.58	26.99
Births	24.81	25.49	25.44	24.26
Deaths.....	26.88	24.02	22.67	26.43

Mortality Statistics of Germany.—The Imperial Board of Health² presents figures showing that the mortality in German cities of 15,000 inhabitants had been reduced from 27 per 1000 in 1877 to 19.7 per 1000 in 1901. The mortality from typhoid fever was reduced in the same time from 46 per 100,000 to 11. That of puerperal fever was also reduced from 15.4 to 5.5; that of consumption from 372 per 100,000 to 205.5; that of diphtheria from 104 per 100,000 to 27; that of measles from 30 to 25; that of scarlet fever from 61 to 23.5.

Mortality from Infectious Diseases in Russia in 1901 and 1902.³—Very many deaths from typhoid fever appear to be registered under the simple word "fever" which do not appear in the following figures.

	1901.	1902.
Deaths from smallpox.....	39,542	41,687
" " typhus fever.....	4,186	4,187
" " typhoid fever.....	17,604	16,167
" " dysentery	20,461	11,979
" " infantile diarrhea	231,460	195,191
" " diphtheria	58,206	45,105
" " scarlet fever.....	112,005	80,661
" " measles	108,988	138,269
" " whooping-cough	65,922	88,634
" " anthrax	2,226	2,052
" " rabies	280	206

Health of European Armies.—Lowenthal,⁴ after eliminating

¹ General Abstract of Marriages, Births, and Deaths registered in England and Wales in 1903. London, 1904.

² Catalogue of Exhibit at World's Fair at St. Louis, 1904, p. 15.

³ Veröff. d. Kais. Gesund., 1904, 528 and 529.

⁴ Brit. Med. Jour., May 7, 1904, p. 1087; quoted from La Revue.

certain errors, presents the following figures for the French, German, and British armies with reference to the prevalence of certain diseases: The death-rate of the British army in the United Kingdom in 1901 was 6.2 per 1000, that of the French 5.11 per 1000, and that of the German only 2.23. With reference to special diseases he presents the following:

TYPHOID FEVER.

	Morbidity, per 1000 men.	Mortality, per 1000 men.
French army at home.....	4.88	0.71
German army at home.....	1.60	0.17
British army at home.....	1.60	0.29

The figures for smallpox are equally striking:

CASES AND DEATHS FROM SMALLPOX.

	Cases.	Deaths.
French army.....	8974	739 } in the period
German army.....	16	3 } 1875-1901
British army.....	6	1 in the year 1901.

SCARLET FEVER AND DIPHTHERIA.

	SCARLET FEVER.		DIPHTHERIA.	
	Morbidity.	Mortality.	Morbidity.	Mortality.
French army.....	5.98	0.24	2.05	0.08
German army.....	0.81	0.04	0.59	0.01
British army.....	4.50	0.03	0.70	0.02

TUBERCULOSIS.

Rates per 1000 men.

	Morbidity.	Mortality.	Invalided.	Total Lost.
French army.....	8.30	1.05	8.15	9.20
German army.....	2.00	0.26	1.51	1.77
British army.....	4.90	0.71	0.59	1.30

Lowenthal concludes that the whole subject of army statistics needs coordination, reorganization, and international agreement, and that careful investigation should be made and reforms instituted, in order that it shall not be said that men are discharged in large numbers who subsequently become a burden on the community, owing to their health having been permanently damaged while engaged in the country's service. The foregoing figures show that this statement applies particularly to the French army.

British Army; Prevalence of Venereal and other Diseases.—The Report of the Army Medical Department for 1901 (published 1904) showed admission rates at different stations varying from 214 per 1000 men in Dublin to 51.9 in Cork in 1900, and from 193.8 in Dublin to 67.8

in Eastern Division of England in 1901. As many as 4.2 per 1000 were constantly rendered ineffective by reason of gonorrhea. About one-half of the cases of illness among soldiers were due to venereal disease. Nearly one-third of the soldiers in the British army are under 20 years of age. Malarial fevers are the scourge of British troops in India, but are not very fatal. Out of 18,217 cases there were only 35 deaths from this cause.

The Housing of the Irish Population in the 60 Years, 1841-1901.—Mattheson¹ discusses the present condition of the Irish people, with reference to their housing, and the changes which have taken place in 60 years, as shown by the census reports. He divides houses into 4 classes, the fourth or lowest comprising cabins built of mud or perishable material with only one room and window; the third class, a better type having from 1 to 4 rooms and windows; the second, consisting of good farm-houses having from 5 to 9 rooms and windows; and the first class comprises all houses of a better type than either of the foregoing. The total number of houses in Ireland had fallen from 1,328,839 in 1841 to 858,158 in 1901, this reduction being a natural consequence of a similar reduction in the population. Fortunately the mud cabins or fourth class suffered the greatest reduction, these having been 491,278, or 36.97 % of the whole number, in 1841, while the same class had fallen to only 9873, or 1.15 % of the whole, in 1901. The third class had also fallen from 40.1 % in 1841 to 29.3 % of the whole in 1901. The second and first classes had both materially increased in the same period. *One-room tenements.* The following figures for 1901 show the unenviable position of Dublin with regard to overcrowding as compared with other cities, English and Scotch:

	Number of one-room tenements having five or more occupants in each, in every 100 tenements of all classes.	Number of persons in one-room tenements with five or more occupants in every 100 of the total population.
Dublin	8.69	10.61
Belfast	0.09	0.10
London	0.57	0.70
Liverpool	0.22	0.24
Manchester	0.04	0.05
Edinburgh	1.80	2.33
Glasgow	4.28	5.24

The total number of one-room tenements in Ireland in 1901 was 79,149. Of these, there were 20,994 instances in which the room had only one occupant; 41,918 where the room had 2, 3, or 4 occupants; 13,351 in which there were 5, 6, or 7 occupants; and 2886 in which there were 8 or more occupants, including 786 cases of 9 occupants in each, 364 of 10 persons, 138 of 11, and 68 of 12 or more persons in the single room.

The Italian and Public Health.—Under the foregoing title the Medical Record² quotes Drs. J. M. Eager, Briodisi, and Stella, with reference to the health of Italian immigrants coming to America. The greater part of these immigrants are sturdy mountaineers from the southern Apennines, and are of healthy parentage and good habits, but

¹ Dublin Jour. Med. Sci., July, 1903, p. 52.

² June 4, 1904.

in coming to America their mode of living is contrary to the laws of health, and gives rise to sickness and physical degeneration, since they come from an outdoor and rural life into the crowded tenements of cities. Tuberculosis is rife among them. The rational solution of the problem would seem to be the foundation of agricultural colonies, under the protection of the Italian Government, in which their immigrants might lead a life in conformity with their accustomed habits.

Loss of Life in 1903.—The following figures,¹ which must necessarily be incomplete, are presented for the United States:

Loss of life by railroad accidents in 1903, deaths not including	
573 killed on electric railroads.....	4090
Loss of life by other disasters:	
Wrecks at sea and on inland lakes and rivers.....	1935
By fires.....	1792
By drowning.....	2471
By explosions.....	736
By falling buildings, etc.....	474
By electricity.....	156
In mines.....	788
By cyclones and storms.....	487
By lightning.....	139

There were 8976 crimes resulting in death by violence, as compared with 8834 in 1902. Legal executions, 123. Lynchings, 104; these had decreased from 235 in 1892, and 184 in 1885. There were 8597 suicides, 4050 by poisoning and 3627 by shooting; 5385 were men and 3212 were women. Fourth of July casualties in 1903, 406 by tetanus and 60 by other injuries.

INFANT MORTALITY.

Moore,² Medical Officer of Health of Huddersfield, England, makes the following suggestions for the **prevention of infant mortality**: (1) The obtaining of additional statutory powers: (a) To prohibit the use of undigested farinaceous foods for infants less than 7 months old; (b) to prohibit the use of feeding-bottles with tubes; (c) to regulate the putting out of children to nurse; (d) to prohibit the leaving of young children alone in circumstances of danger; (e) to prohibit women engaging in certain work in the last month of pregnancy, and from resuming work for an extended period after confinement; (f) to enable inducements to be offered to mothers and guardians to give children the breast and otherwise to maintain their health; (g) over milk-supply, storage, and sale; (h) prohibition of statements in advertisements to the effect that foods which are useless for infants are beneficial; (k) prohibition of sending infants out to nurse, except to proper places and to proper persons. (2) That small payments be made to registrars, midwives, and others for notifications of births, if made within 7 days (registration is not required by law for 42 days). (3) Appointment of at least two Lady Health Visitors.

¹ Jour. Am. Med. Assoc., Mar. 12, 1904.

² Special Report, June 2, 1904.

(4) Provision of a day nursery and milk depot combined. The milk to be obtained, stored, and prepared with the nearest approach to ideal conditions that can be obtained, but not at present sterilized. (5) Printed advice and warning. (6) Weekly advertisements in local papers that all who have or are about to have babies or children in their care can obtain full information and rules for their guidance on application to the Public Health Department.

Infant Mortality.—Crichton-Browne¹ quotes the health officer of Liverpool as stating that fainting conditions have no marked influence on infant mortality, but that methods of feeding are mostly responsible. "Of the milk foods," he says, "which are generally prepared from milk condensed, sweetened, and then evaporated to dryness with the addition of flour of one kind or another, partly converted into dextrin, some show an excess of carbohydrates, largely consisting of starch, which is quite unsuitable for an infant under 9 months old; others are overloaded with sugar or fat, and all have objectionable features." His chief objection to condensed milk lies in the fact that it is too often prepared from skimmed milk and is therefore largely deprived of the cream, and if made of whole milk, is so freely sweetened with cane-sugar as to reduce the proper proportions of the other elements. "Even indolent mothers would hesitate to use the proprietary foods if they knew that the pleasing plumpness they produce is a hollow mockery and that their exclusive use often leads to anemia, rickets, and scurvy, and undermines the resistance to infectious disease." (See analysis of condensed milk, page 612.)

Infant Mortality in England; Overlying.—Mr. Westcott,² coroner for the North Eastern District of London, gives the following terrible record: "During the recent ten years there were 15,000 overlain infants in England and Wales, and in the year 1900 there were 1774. In Liverpool in one year, there were 143 cases out of 960 inquests, or more than 1 in 7 cases. In 1901 there were 511 such cases and in 1900 there were 615 in London alone." The majority of these cases occur on Saturday nights and are due to the drunkenness of parents.

Milk and Infant Mortality.—By means of the introducing of improved methods of milk-supply in Liverpool³ the infant mortality among infants fed upon this milk has been reduced to 78 per 1000, as compared with an average of 159 per 1000 for the whole city, and 88 to 118 for the best districts and 212 to 215 for the worst.

Cancer Mortality in Austria.—Prinzing⁴ presents the following death-rates from cancer in the different provinces of Austria from 1876 to 1900:

¹ Med. Mag., June, 1904, p. 418.

² Report of National Society for Prevention of Cruelty to Children, London, 1903-04.

³ Med. Mag., May, 1904.

⁴ Der Krebs in Österreich; Centralblatt f. Allg. Gesundheitspflege, 23, 1904, p. 209.

CANCER MORTALITY IN AUSTRIA BY FIVE-YEAR PERIODS.
1876-1900.

Deaths from Cancer per 10,000 Inhabitants.

Districts.	1876-80.	1881-85.	1886-90.	1891-95.	1896-1900.
Lower Austria.....	8.2	8.5	8.8	10.2	10.8
Upper Austria.....	7.2	7.5	8.7	9.8	11.4
Salzburg.....	10.7	9.7	11.9	13.2	13.6
Styria.....	4.8	5.7	6.4	7.1	7.7
Tyrol.....	6.6	7.4	7.4	8.0	10.5
Vorarlberg.....	10.4	9.3	9.2	9.5	10.3
Bohemia.....	4.4	4.9	5.5	7.3	9.1
Moravia.....	3.0	4.4	5.7	6.3	8.0

MISCELLANEOUS.

The Bacteriology of Ink.—Several deaths occurred in Switzerland in 1901 which were attributed to “pricks from pens dipped in ink containing molds and other harmful bacteria.” Flügge was commissioned to investigate the matter.¹ He came to the conclusion that ordinary ink, either fresh or after prolonged use, contains no harmful microorganisms, and has a very great disinfecting power, especially against those which produce blood-poisoning. If pen-pricks give rise to septic disease, it can only be through secondary infection.

Lead Poisoning from Wall-paper.—Lefour² gives an account of a case of a pregnant woman who showed signs of lead poisoning, the origin of which was obscure. Her urine contained 1 milligram of lead per liter. Lead was found in the wall-paper of the house. Other papers taken from a warehouse were found to contain lead.

¹ Hyg. Rundschau, 4.

² Presse Méd., May 14, 1904.

PHYSIOLOGIC CHEMISTRY.

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INTRODUCTION.

THAT the importance of physiologic chemistry in medicine is being more and more recognized¹ is evidenced by the enormous number of papers which are constantly appearing upon the subject; several journals are devoted entirely to it, while each year a larger part of other medical journals are taken up by chemic articles. The literature on any one branch of the subject is so vast that there is a demand for frequent general summaries and books upon special topics, and such are appearing almost weekly. Among the most valuable of these summaries are those appearing in almost every number of the *Biochemisches Centralblatt*. Of great value also are the more comprehensive reviews which appear in the *Ergebnisse der Physiologie*; some of these reviews are in reality monographs treating various subjects in a very exhaustive manner. In America Levene² has published a "Review of Recent Work in Biological Chemistry." Among the books dealing with special topics may be mentioned: Waldvogel's "Die Acetonkorper,"³ in which the origin of these bodies, their relation to diabetes, etc., are discussed; Seegen's collected works on sugar-formation in the body; a fourth edition of Koenig's great work, "Chemie der Menschlichen Nahrungs und Genussmittel," in 2 volumes, with over 3000 pages; Gautier's⁴ work, "L'Alimentation et les Régimes chez l'homme sain et chez les malades," and a new edition of Cohnheim's "Eiweisskorper"; a new edition of Hammarsten's "Physiological Chemistry." The continued interest in the purin-bodies is shown by a book by Mouneyrat,⁵ "La purine et ses dérivés," which is largely chemic, and a second edition of Walker Hall's "Purin-bodies of Food-stuffs." Numerous manuals for laboratory work in physiologic chemistry have also appeared. Thus Orndorff has translated and edited Salkowski's "Laboratory Manual of Physiological and Pathological Chemistry"; Milroy has published a "Practical Manual of Physiological Chemistry"; new editions of the laboratory manuals of Kossel and Jackson have appeared.

The fourth edition of Lenhartz's "Mikroskopie und Chemie am Krankenbett" (also in a translation by Brooks) contains a valuable section on the Cryoscopy of the Blood and Urine.

¹ See, e. g., Barker, Jour. Am. Med. Assoc., 53, p. 811.

² Jour. Am. Chem. Soc., 26, p. 308.

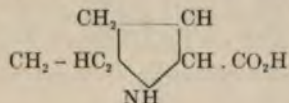
⁴ Paris, 1904.

³ Stuttgart, 1903.

⁵ Paris, 1904.

Noteworthy advances have been made in nearly all fields of physiologic chemistry, and subjects which a few years ago seemed beyond its scope have already an extensive literature; this is especially the case with such subjects as the toxins and antitoxins and the autolytic ferments. The methods of physical chemistry are being extensively employed, with more or less success, in the solution of numerous problems. It is perhaps, however, in the field of proteid chemistry that the most satisfactory and evidently permanent advances are being made; and here the work of Emil Fischer occupies a commanding place.

Too much attention can scarcely be given to Fischer's recent work on pancreatic digestion. Two years ago this remarkable chemist found, among the hydrolytic products of casein, α -pyrrolidin carbonic acid, a cyclic compound having the structure represented by the formula



and a representative of a grouping which had not at the time been suspected in the proteid molecule. As Fisher subsequently showed that this substance is formed by hydrolysis of a large number of proteids, and therefore represents a grouping which is in all probability essential to this proteid molecule, it became necessary to show that the acid is a primary decomposition-product and not one formed from some known hydrolytic product by the action of the hydrolytic agent or by chemie processes employed in its isolation. Thus form arginin:

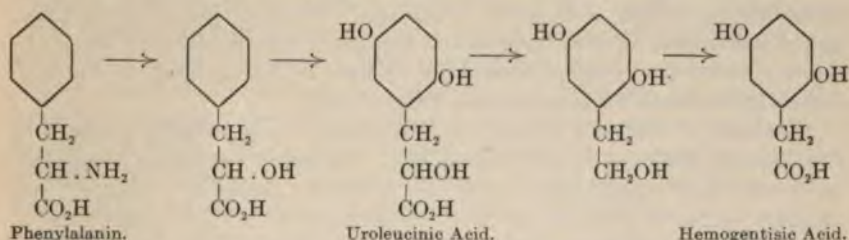


α -Pyrrolidin carbonic acid might easily be conceived to be formed by ring closure as indicated. Fischer was therefore anxious to find the cyclic acid among the products of ferment action, and thus be in a position to state positively that the substance is a primary decomposition-product. For this purpose he chose pancreatic digestion, but much to his astonishment he was unable to show the presence of more than a trace of the cyclic acid among the products of the action of trypsin on casein even after the digestion had proceeded for several months. There was found present, however, a substance precipitable by phosphotungstic acid, and therefore capable of separation from all the monamidoacids formed in a pancreatic digestion. This substance, termed a "polypeptid," is an end-product of pancreatic digestion, but can be split up by boiling acids when α -pyrrolidin carbonic acid is produced and in quantity approximately equal to that formed when an amount of casein equal to that from which polypeptid was derived is boiled at once with mineral acids. In a pancreatic digestion of proteid, therefore, certain groups of the proteid molecule are split off and appear as amidoacids, while other groups remain in com-

decomposition of arginin into urea and ornithin, as stated above. Arginin is, therefore, continually formed in the tissues under the action of the proteolytic enzymes, but is decomposed by the arginase, the urea thus formed contributing to the urea of the urine.

Abderhalden's adventures in the field of the protamins (see below) should not be too seriously considered. The combination "Fischer and Abderhalden" is unsurpassed, but Abderhalden has a tendency, when alone, to enter, controversially, fields which are occupied by experts of 15 years' standing. We imagine that it is perfectly easy to prepare specimens of protamin which will yield *all* the decomposition-products of proteids, but not so easy to prepare specimens which yield only a few of these decomposition-products.

After an extended investigation on the **destiny of aromatic acids in alkaptonuria**, Neubauer and Falta¹ conclude that uroleucinic acid and homogentisic acid are formed from both phenylalanin and tyrosin, and in the following manner: Phenylalanin is first converted into phenyl- α -lactic acid; this is changed into uroleucinic acid, which in turn, by splitting off of CO_2 , and subsequent oxidation, becomes homogentisic acid.



Tyrosin suffers a similar series of changes, but its phenolhydroxyl group is removed at some stage before the introduction of the 2 hydroxyl groups in the positions 2 and 5.

Langstein and Mayer² show that the **homogentisic acid in the urine** of alkaptonuria arises from the proteid of the body as well as from that of the food; several other points of interest in connection with this subject are discussed.

Aminoacids.—Taylor³ examined 8 degenerated livers for **aminoacids**; he found them in but one case (chloroform necrosis).

Neuberg and Ríchter⁴ found, in a case of **acute yellow atrophy of the liver**, 2.13 gm. aminoacids (tyrosin, leucin, and lysin) in 345 cc. of blood; the authors think that this came either from a breaking-down of muscle or from a change in the intestinal mucosa which permitted these crystalline end-products of proteid digestion to pass through unchanged.

Arginase.—Drechsel's discovery of lysatinin among the hydrolytic products of casein, and that this substance, by further hydrolysis, would yield urea, represents the first, and aside from Jolles' disputed work the only, production of **urea from proteids by any laboratory process.** It

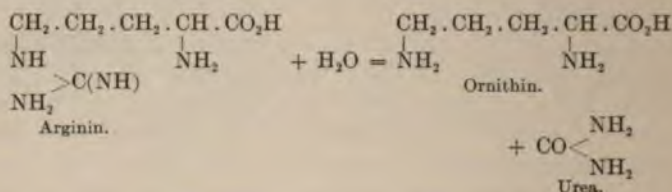
¹ Zeit. f. physiol. Chem., 42, 81.

² Deut. Arch. f. klin. Med., 78, p. 161.

³ Univ. of Cal. Pub., 1, p. 43.

⁴ Deut. med. Woch., 30, p. 499.

is now known that lysatinin produces urea by virtue of the arginin which it contains (lysatinin being a mixture of arginin and lysin), and that arginin is a constant hydrolytic product not only of casein, but of all other proteids; so that all proteids should be capable of forming urea by simple hydrolysis, and while this origin of at least a part of the urea of the urine has been very generally accepted, it has not been possible to state through what agencies nor in what tissues the decompositions involved occur. Kossel and Dakin¹ now find in the intestinal mucosa an enzym which, at the body-temperature, is capable of causing the decomposition of arginin into ornithin and urea.



This enzym, which is termed "arginase," was also found in the liver, and its presence in the thymus and kidney is also suspected, since the arginin which one might reasonably expect to be formed in the self-digestion of these organs has not been found.²

Arsenic.—Gautier's contention that arsenic is **constantly present in the animal body** has been questioned; his work has been confirmed, however, by Segale,³ who employed different methods. Gautier⁴ has recently made a number of new contributions on the occurrence of arsenic in food. Common salt is considered one of the chief sources from which the body derives its supply. He maintains his view that arsenic is constantly present in the muscle of mammals and fish, and in a later article (with Clausmann⁵) gives elaborate tables showing the amount found in various articles of food; fish and lobsters are especially rich in arsenic. Wine, water, and salt are the chief sources of the arsenic found in the body. He calculates that a Parisian receives about 7.66 mg. of arsenic in his food in a year, a quantity which he thinks sufficient to meet the needs of the body. The medicolegal bearings of the work are pointed out. If the contents of the intestines show more than $\frac{1}{10}$ mg. of arsenic, we may be sure that it did not come from normal food. Bordas⁶ finds arsenic in appreciable quantities in glycerin, glycerophosphates, and chicory.

Levene⁷ examined the products of a 10 months' self-digestion of the pancreas, using Fischer's method for the separation of amidoacids, and found alanin, phenylalanin, and amidovaleric acid, but was unable to

¹ Zeit. f. physiol. Chem., 41, 321.

² Kutscher and Seemann, Zeit. f. physiol. Chem., 34, 114; 35, 440. Dakin, Jour. Physiol., 30, 84.

³ Zeit. f. physiol. Chem., 42, p. 175.

⁴ C. R. Acad. Sci., 137, pp. 232 and 295.

⁵ Ibid., 139, p. 101.

⁶ Ibid., p. 234.

⁷ Zeit. f. physiol. Chem., 41, 393.

prove the presence of α -pyrrolidin carbonic acid. Levene had already made the interesting observation that in the **self-digestion of the pancreas**, uracil is formed, but not thymine. This would naturally lead to the conclusion that the pancreas is capable of converting thymine into uracil, which, however, Levene finds is not the case, for after digesting pure thymine with the pancreas for 11 months, the substance was recovered unchanged. Similar experiments with the liver showed that in a prolonged autodigestion alanine, amidovaleric acid, leucine, aspartic acid, tyrosine, phenylalanine, and glutamic acid are formed, but neither glycocoll nor α -pyrrolidin carbonic acid. Of the pyrimidine derivatives, as with the pancreas, uracil was found, but neither thymine nor cytosine, although all three substances are produced by hydrolysis of the nucleic acid of the organ with boiling mineral acids. So far as these results concern phenylalanine and α -pyrrolidin carbonic acid, they are of the greatest interest. Fischer's recent work on pancreatic digestion would suggest with great probability that in the self-digestion of these organs there would finally be formed a polypeptide which would contain all the groups of both phenylalanine and α -pyrrolidin carbonic acid originally present in the proteids of the organs. Hydrolytic operations employed in the method of isolation could decompose the polypeptide with the formation of both the acids in question. Levene, however, finds the one but not the other. It is, of course, possible that under the conditions of Levene's experiment the ferment splits off phenylalanine, but not α -pyrrolidin carbonic acid, and it is this possibility which gives special interest to his results. Levene obtained similar results in the autodigestion of the testes¹ and liver. With these organs he obtained a substance which he believes to be amido-butyric acid, a substance not hitherto identified among the decomposition-products of proteids.

It was formerly supposed that the hydrolysis of nucleic acids gave rise to four xanthine bases, viz., xanthine, hypoxanthine, guanine, and adenine, and Kossel's doctrine assumed the existence of 4 different nucleic acids, each of which gives rise to one of the bases named. But the recent work of a number of chemists has shown that, **properly purified, nucleic acids yield only 2 xanthine bases**, viz., guanine and adenine, and we may expect these and only these 2 bases whenever a nucleic acid is split up. Jones² finds, however, that in the self-digestion of the thymus (which is peculiarly rich in nucleic acid) there are formed a great preponderance of xanthine and a trace of hypoxanthine, but no provable amount of either guanine or adenine. The xanthine thus formed, moreover, results from the nucleic acid and from no other constituent of the gland, for after purification of the nucleoproteid by well-known methods and thus freeing it from all soluble constituents of the gland, the material was found to be enzymatic and produced, on self-digestion, the same results as were found by using the entire gland. With the suprarenal gland the same result was reached, and it was shown here that the decomposition of the nucleic acid in self-digestion is not caused by trypsin. In the case of the pancreas, xanthine and hypoxanthine were found in about the same ratio as the

¹ Am. Jour. Physiol., xi, 437.

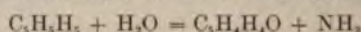
² Zeit. f. physiol. Chem., 41, 101.

guanin and adenin formed by hydrolysis, but, as in the case of the thymus and suprarenal gland, no trace of either guanin or adenin is formed in the self-digestion. In the self-digestion of the spleen hypoxanthin is formed at the expense of adenin, but guanin is formed in the self-digestion just as in ordinary hydrolysis.¹ These results find an easy explanation in the assumption that the organism contains 3 enzymes having functions as follows:

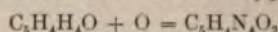
1. Guanase, which causes the conversion of guanin into xanthin—



2. Adenase, which causes the conversion of adenin into hypoxanthin—



3. Sarcase, which causes the conversion of hypoxanthin into xanthin—



The results obtained in autodigestion are perfectly explained if we assume that the thymus and suprarenal gland contain all three enzymes; that the pancreas contains the first two, but not the third; and that the spleen contains only adenase.

The existence of **guanase** was proved beyond doubt by Jones and Partridge,² who showed that pure guanin, when allowed to stand at the body-temperature with finely divided pancreas, is converted into xanthin. As in the case of the purin-bodies, so also the pyrimin derivatives formed in the autodigestion of organs are not the same as those formed by hydrolysis of the corresponding nucleic acids. **Uracil is formed at the expense of both cytosin and thymin**, a phenomenon shown by Levene in the cases of the liver and pancreas and by Jones, with the thymus and spleen.

Wells³ did not find that extracts of thyroid, kidney, and spleen have any decided effect upon the autolysis of the liver of the dog; a positive result might have been expected from the fact that such extracts have a modifying influence upon proteid metabolism.

That the **autolytic ferments of the liver** do not have their origin in the pancreas is shown by the experiments of Matthes,⁴ in which the pancreas of dogs was removed; autolytic ferments were still found in the liver.

A new hemostatic agent, **stagnin**, obtained from the autolysis of the spleen, is described by Landau and Hirsch.⁵

O. Adler and R. Adler⁶ propose a **test for blood** which cannot be produced with iron salts nor by oxidases (which give the guaiacum test). The material to be tested is mixed with a solution of tetramethyldiamidotriphenylmethane (the prepared reagent can be purchased), and the mixture treated with a 3 % solution of hydrogen peroxid. In the presence of blood a deep green color is produced. The test is more sensi-

¹ Zeit. f. physiol. Chem., 42, 35.

² Am. Jour. Physiol., 11, p. 351.

³ Berl. klin. Woch., 41, p. 577.

⁴ Zeit. f. physiol. Chem., 42, 343.

⁵ Arch. exp. Path. u. Pharm., 51, p. 442.

⁶ Zeit. f. physiol. Chem., 41, 59.

tive than the guaiacum test, and may be applied to spots, urine, feces, and stomach-washings.

Hauser¹ warns against the use of the serum of too highly immunized animals in making the **biologic test for human blood**; such a serum forms precipitates with the blood of calves, swine, and fowls as well as with human blood. Marx and Ehrenrooth² recommend the use of the **agglutination test**; fresh blood is not agglutinated by human blood, but is agglutinated by that of most other animals. A thorough discussion of the biologic blood test with a report of its employment in a medicolegal case is given by Robin.³

The intimate **relation between antihemolysins and the kidneys** is shown by both clinical and experimental observations. Senator⁴ confirmed, in 2 of 3 cases, the observation of E. Neisser and Döring that the inactivated serum of uremia inhibits the hemolysis of rabbits' blood by normal active serum. Meltzer and Salant⁵ find an antihemolysin in the serum of nephrectomized rabbits; this inhibits hemolysis of rabbit corpuscles by ox serum. Morris⁶ found hemolysins in the urine in cases of pernicious anemia.

Guerrini⁷ obtained a **hemolytic and hemotoxic serum** for dogs by immunizing rabbits with a nucleoproteid obtained from the blood of the dog. Bierry and Petit⁸ obtained in a similar way **cytotoxins** for the kidney and liver by immunizing rabbits with nucleoproteids obtained from these organs of the dog. Bierry and Mayer⁹ produced a condition analogous to **alimentary glycosuria** by administration of small doses of sugar to dogs which had been injected with hepatotoxins. The latter were contained in the blood of rabbits which had been injected with nucleoproteids obtained from the liver.

Langstein and Mayer¹⁰ make an interesting study of the **proteids of blood-plasma in experimental infections**. Under the influence of pneumococcus and streptococcus infection there was a great increase in the fibrinogen. In normal rabbits the proteid quotient (globulin: albumin) is 1:2; in almost all infections this rises and may reach 1:1.

Hawk and Gies¹¹ contribute an elaborate article on the influence of **external hemorrhage** on chemic changes in the organism, with particular reference to **proteid catabolism**; for details the original must be consulted. One result found was an increased output of nitrogenous and sulfur-containing products in the urine and usually a decreased excretion of phosphorized substances.

Galeotti¹² found the **alkalinity of the blood** to be markedly decreased (36 % to 44 %) at high altitudes (summit of Monte Rosa); he thinks this to be due to the diminished O-pressure, for similar, though less marked, changes were found in dogs made to breathe air containing little oxygen.

Münch. med. Woch., 1904, p. 289. ² Ibid., p. 293.

³ N. Y. and Phila. Med. Jour., 79, pp. 433 and 500.

⁴ Berl. klin. Woch., 41, p. 181.

⁵ Proc. Soc. Exp. Biol. and Med., 1, p. 37.

⁶ Am. Jour. Med. Sci., 127, p. 1026.

⁷ Biochem. Centralbl., 2, p. 451.

⁸ C. R. Soc. Biol., 56, p. 238.

⁹ C. R. Acad. d. Sci., 138, p. 639.

¹⁰ Beft. Chem. Physiol. u. Path., 5, p. 69.

¹¹ Am. Jour. Physiol., 11, p. 171.

¹² Biochem. Centralbl., 2, p. 482.

[These results are in line with other recent work showing that an insufficient O-supply causes an increase in the fatty acids of the blood.]

Bordet and Gengou¹ have continued their studies on **blood coagulation**. They find that serum converts fibrinogen into fibrin in the absence of calcium salts. The serum also has the power of converting a fibrin-proferment into a ferment; calcium is necessary for this action. Boggs² discusses the effect of various substances upon the coagulation-time of the blood in the living organism. In one series of experiments gelatin hastened the coagulation; in others the result was negative. Thrombokinase, derived from the thymus, and calcium salts hastened the coagulation. Boggs recommends calcium lactate for therapeutic use.

The **relation of gelatin and calcium to the coagulation of the blood** is discussed by Gley and Richaud.³ Any coagulating action of gelatin is attributed entirely to the calcium contained in it. On the other hand, certain substances (gelatoses) are contained in gelatin which tend to delay or prevent coagulation. They consider gelatin to be unfitted for general hemostasis. Meltzer and Salant⁴ find that double nephrectomy causes a prolongation of the coagulation-time of the blood of rabbits.

Burton-Opitz⁵ finds that the **viscosity of the blood** is increased by the intravenous injection of distilled water, concentrated solutions of dextrose, curare, and alcohol; physiologic sodium chlorid solution leads to a lessened viscosity. The less the viscosity, the longer, in general, is the period required for extravascular coagulation.

Hervieux⁶ found a small amount of **indoxyl** in the blood; he removed the proteids by basic lead acetate and detected the indoxyl by the isatin reaction.

Erben⁷ directs attention to the fact that he found, 3 years ago, peptic and tryptic **ferments in leukemic blood**; this observation explains the finding, by Schumm,⁸ of various products of proteolysis in such blood.

A thorough discussion of the methods for the quantitative **chemic analysis of the brain and cord** is contributed by Koch⁹; the results of detailed analyses of white and gray matter are given.

Casein.—From a large amount of experimental evidence Loevenhart¹⁰ concludes that **casein** and paracasein differ only in the size of their aggregates, since all reagents which might be expected to change the state of aggregation will cause coagulation of milk.

Gürber and Hallauer¹¹ recovered **casein from the bile** after its intravenous injection; they think that the nonappearance in the urine of foreign proteids thus injected is no proof that they have been assimilated by the organism. They found no evidence that casein injected into the blood is utilized by the body.

Cholin.—Kutscher and Lohmann find cholin among the products of

¹ Ann. de l'Inst. Past., 18., p. 98.

² La Presse méd., 1904, 1, p. 249.

³ Proc. Soc. Exp. Biol. and Med., 1, p. 23.

⁴ Beitr. Chem. Physiol. u. Path., 5, p. 461.

⁵ Am. Jour. Physiol., 11, p. 303.

⁶ Zeit. Biol., 45, p. 372.

⁷ Deut. Arch. f. klin. Med., 79, p. 539.

⁸ Jour. of Med. Research, 12, p. 63.

⁹ C. R. Soc. Biol., 56, p. 622.

¹⁰ Ibid., 4, p. 442.

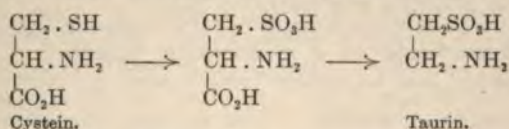
¹¹ Zeit. f. physiol. Chem., 41, 177.

the self-digestion of the pancreas¹ and also of the liver.² The formation of the substance is due evidently to the action of a fat-splitting enzym on lecithin.

Allen³ reports what he considers to be a very trustworthy method for detecting **cholin in blood**, etc.; this method is based on the fact that cholin (extracted from the blood by alcohol) yields a reddish-brown color with iodine. By this method cholin has been found in the blood in a variety of diseases accompanied by extensive lesions of the nervous system.

Creatinin.—Folin⁴ describes a **rapid and accurate method for determination of creatinin** based on Jaffé's reaction with picric acid and sodium hydroxid. Ten cc. of urine are treated with 15 cc. of a saturated aqueous solution of picric acid, 5 cc. of 10 % caustic soda are added, and the mixture allowed to stand 5 minutes for the development of the color. The fluid is then diluted to 500 cc. and the length of the column of this solution (x) is found, which matches the color of a column of half normal potassium bichromate solution, 8.1 mm. high, $\frac{8.1}{x}$ = the number of milligrams of creatinin in 1 cc. of urine. The method is easy of execution and requires only the bichromate solution, which may be preserved indefinitely, and 2 color comparators. Folin uses this method for a solution of the question of the presence or absence of creatin in the urine, and explains the confusion which exists in the literature on the subject. The creatinin is determined in the urine. After boiling a specimen of the urine with hydrochloric acid a second determination of creatinin is made and any difference noted is attributed to creatin. He concludes that some specimens of urine contain creatin; others do not. In some urines which do not contain creatin the substance is formed at the expense of creatinin when the urine is allowed to stand. Folin takes advantage of a large amount of pure creatinin which had accumulated in his work to show that the Kjeldahl method is suitable to determination of nitrogen in this compound, and also suggests the use of zinc sulfate, copper sulfate, and sodium sulfate in addition to the usual 20 cc. of acid ordinarily used for the digestion.

Cystin.—Mörner's discovery of cystin as a hydrolytic product of proteids naturally indicated this group as the origin of the taurin which exists as taurocholic acid in the bile; but it was difficult to see how such a derivation is possible if the accepted formulas for the 2 substances are correct. The difficulty was cleared up by the splendid work of Friedmann,⁵ who showed that the **accepted formula for cystin was wrong**, and succeeded in transforming cystein into taurin, thus:



¹ Zeit. f. physiol. Chem., 39, p. 159.

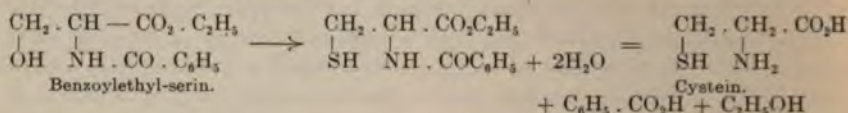
² Ibid., p. 313.

³ Jour. Physiol., 31, No. 5, p. lvi.

⁴ Zeit. f. physiol. Chem., 41, 223.

⁵ Beit. z. chem. Physiol. u. Path., 2, 433, and 3, 1.

Erlenmeyer¹ confirms this result by showing that the ethyl-ether of benzoyl-serin upon treatment with phosphorus pentasulfid and subsequent hydrolysis yields cystein, thus:



Von Bergmann² found that the **feeding of cystin** alone did not increase the taurin of the bile, but that feeding both cystin and sodium cholate did increase the sulfur (taurin) of this secretion. This observation led Simon and Campbell³ to give sodium cholate in a case of cystinuria with the thought that perhaps it would unite with the cystin in the body; such a union, however, did not occur.

Digestion.—The work of Cohnheim on the combined glycolytic action of the pancreas and muscle is familiar to every one. Levene and Stookey⁴ now make similar observations on the **proteolytic power of combined gland extracts**. They found that when spleen and pancreas were allowed to act simultaneously on a foreign proteid,—*e. g.*, egg-albumin or casein, the quantity of the products of digestion resulting was greater than the total sum of the products obtained by the digestion of equal quantities of spleen and pancreas acting separately. It was thus not a summation of the action of the 2 enzymes, but an increase in the digesting energy of one or both. They cite evidence which seems to corroborate the views of Schiff, Herzen, and Mendel and Rettger, that the spleen facilitates the transformation of the pancreatic zymogen into the active enzyme.

Sehrt⁵ finds a **ferment in the muscle of a mummy** about 2200 years old. An extract of the muscle mixed with an extract of ox pancreas had a glycolytic action upon dextrose; either extract alone had no action.

Important results were reached by Hekma⁶ on the **transformation of trypsinogen into trypsin**. Enterokinase or zymolysin, by which the trypsinogen is converted into trypsin, was found in the epithelial layer (not in the leukocytes) of especially the duodenum and upper part of the jejunum; the spleen seemed to be entirely free from it (contrary to the Schiff-Herzen theory). The transformation of trypsinogen into trypsin in aqueous extracts of the organ is due to bacteria; the action of the latter is inhibited by antiseptics, dilute acids, and alkalis. Heidenhain's view that acids cause the transformation is incorrect.

After a careful search for tetramethylenediamin and pentamethylenediamin among the products of a tryptic digestion Kutscher and Lohmann⁷ decide that the 2 substances are absent and that **arginin and lysin are therefore end-products of a pancreatic digestion**. The work of Lawrow,⁸ Salaskon,⁹ and Langstein¹⁰ shows that the 2 diamido acids are

¹ Ber. d. d. chem. Ges., 36, 2722.

² Ibid., 5, p. 401.

³ Berl. klin. Woch., 41, p. 497.

⁴ Zeit. f. physiol. Chem., 41, 332.

⁵ Ibid., 32, 592; 38, 567.

⁶ Beit. z. chem. Physiol. u. Path., 4, p. 182.

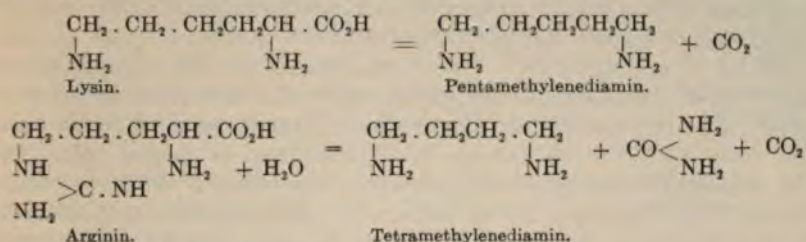
⁷ Jour. Physiol., 12, 1.

⁸ Arch. f. Anat. u. Physiol., 1904, 343.

⁹ Ibid., 26, 513; 33, 312.

¹⁰ Hofmeister's Beit., 1, 507; 2, 229.

only intermediate products in a peptic digestion, giving rise, by further decomposition, to the 2 diamids named, thus—



Bainbridge¹ discusses the **adaptation of the pancreas** to the food. Feeding lactose causes the intestinal mucosa to produce some substance which is carried to the pancreas, which is thus stimulated to produce lactase.

Lorand² discusses the **relation of the pancreas and thyroid**. He finds that when one gland is removed the other hypertrophies; in the pancreas it is the islands of Langerhans which hypertrophy. In dogs diabetic from extirpation of the pancreas thyroidectomy causes the glycosuria to disappear. Several diabetics improved under treatment with the serum or milk of thyroidectomized animals.

Lusk³ finds that there is **no cane-sugar inverting enzym in the gastric juice**; such inversion of cane-sugar as takes place in the stomach is due to the free hydrochloric acid.

Shaw⁴ finds that the **saliva of infants** contains a ferment which can convert small quantities of **starch into maltose**; this action can be detected in the stomach 2 hours after the taking of food.

Woods and Merrill⁵ and Snyder and Woods⁶ find that the bread made from the **finer grades of flour** is more nutritious than that made from coarser grades (Graham and whole wheat flour).

Rockwood⁷ finds that **vegetable proteid**, as judged by the nitrogen in the feces, is less completely utilized than is animal proteid. This seems to be due to admixture with other substances, for no such difference was found when the separated proteid from oats was fed.

The **absorption of nutrient enemas** was studied by Bial⁸ upon himself. He found that 50.5 % of the peptone of a 10 % aqueous solution was absorbed, while of a 10 % peptone solution in 10 % alcohol, 66 % was absorbed. The nutritive value of the latter was 475 calories greater than that of the former—an amount which may be of great value in an individual suffering from inanition.

Albu and Calvo⁹ find that **proteids are entirely absent from the feces of healthy adults**. No albumoses appeared in the feces after the addition of 30 gm. of somatose to the diet. In 20 % of the cases of gastro-

¹ Jour. Physiol., 31, p. 98.

² C. R. Soc. Biol., 56, p. 488.

³ Am. Jour. Physiol., 10, p. xxi.

⁴ Albany Med. Ann., 25, p. 148.

⁵ U. S. Dept. Agr., Exper. Sta., Bull. No. 143.

⁶ Year-Book U. S. Dept. Agr., 1903, p. 347.

⁷ Am. Jour. Physiol., 11, p. 355.

⁸ Arch. f. Verdauungsk., 9, p. 433.

⁹ Zeit. f. klin. Med., 52, p. 98.

intestinal diseases albumin was found in the feces; albumoses also appeared in these cases after 20 or 30 gm. of somatose. In the feces of healthy infants traces of casein and albumin were found; the amounts were much increased in gastrointestinal disturbances.

Hawk and Chamberlain¹ continued Hawk's² studies on the **rate of excretion of nitrogen, sulfate and phosphate**, determining the effect of a small increase in the proteid ingested. The time required to reach the maximum excretion of nitrogen after increasing the proteid of a diet was more or less proportional to the amount ingested, the period being longest when the quantity was large. The rate of sulfate excretion was parallel to that of nitrogen, but reached its maximum later; the maximum rate of phosphate excretion, due to the increased proteid, lay between those of the nitrogen and phosphate.

Fat.—Rosenfeld³ makes an important contribution to the subject of **fatty degeneration**; his chief conclusion is that fat is not formed from proteid, but is transported from one organ to another. Organs often show, microscopically, "fatty degeneration," although there is no real increase of fat; Rosenfeld attributes this to the fat being made visible through autolysis of the proteids, etc., in which it is embedded. Some organs, *e. g.*, the kidneys, never show real increase in the amount of fat.

Determinations of the **lecithin content of fatty extracts** from the kidney by Dunham⁴ are rather opposed to Rosenfeld's views. The "fat" of the kidney contains 200 to 500 times as much phosphorus (mostly in the form of lecithin) as does the fat from the panniculus adiposus; this makes it very improbable that the kidney-fat is simply transported from fat dépôts.

Mavrakis⁵ reports microscopic studies from which he concludes that **fat is formed from cell-proteids**. The injection of diphtheria toxin and of phosphorus into organs whose circulation was cut off by ligature caused fatty degeneration in the liver and kidney.

Hildesheim and Leathes⁶ find a **synthesis of higher fatty acids in the liver** when the finely divided organ is exposed to a stream of moist air in a thermostat from 1 to 3 days; such a liver contains 10 % to 40 % more fat than in the fresh condition. The addition of glycogen causes a still greater increase in the fat.

Pottevin⁷ has succeeded in effecting a **biochemic synthesis of olein** and some other esters by the action of the pancreatic ferment on alcohols and acids. Triolein was obtained by the action of the ferment on mono-olein and oleic acid. Methyl, ethyl, and isoamyl alcohols reacted with oleic acid; stearic acid with amyl-alcohol, etc.

Ramond⁸ states that **blood-serum agglutinates fat**—*i. e.*, causes the emulsion to disappear rapidly.

¹ Am. Jour. Physiol., 10, p. 269.

² Ibid., p. 115.

³ Berl. klin. Woch., 41, pp. 587 and 617.

⁴ Proc. Soc. Exp. Biol. and Med., 1, p. 39; Amer. Med., 7, p. 950.

⁵ Arch. f. Physiol. u. Anat., 1904, p. 94.

⁶ Jour. Physiol., 31, Proc. Physiol. Soc., f. i.

⁷ C. R. Acad. Sci., 138, p. 378.

⁸ C. R. Soc. Biol., 56, p. 353.

Schütze¹ obtained an **antisteapsin** by immunizing rabbits with steapsin.

In a case of **lipemia in diabetes** Neisser and Derlin² found 19.7 % of ether extract (mostly fat) in the blood; this fat resembles that of the food rather than that of the organs.

From the fact that they find glycerin in the jejunum, chyle, venæ portæ, and liver Ramond and Flandrin³ conclude that at least a part of the **fat is split before absorption**.

Lombroso⁴ finds considerable **absorption of fat after ligation of the ducts of the pancreas** (dogs); he attributed this to the lipolytic action of the succus entericus.

Bryant⁵ recommends the use of **carbon tetrachlorid for the extraction of fat** instead of ether.

Taylor⁶ obtained a **synthesis of triolein** by the action of a preparation of the castor-oil bean upon oleic acid and glycerin; he supposes the synthesis to result from a reversion of the action of the fat-splitting ferment. No similar results were obtained with animal lipases; Moore⁷ also obtained negative results in such experiments.

According to Rogers,⁸ **fat-splitting ferments and not bacteria** or other microorganisms are very probably the cause of the changes in canned butter by which it acquires a "fishy" flavor or becomes rancid. Pastronich⁹ finds a similar autohydrolysis of crude animal fats.

Ferments.—Kastle¹⁰ (with Johnson and Elvove) has continued his experiments with **lipase**, using a purer solution than in previous work. The hydrolysis of ethyl butyrate by lipase is a monomolecular reaction. The lipase retains its complete activity, regardless of the amount of substance it has previously hydrolyzed; in this sense it belongs to the true catalyzing agents. The velocity of the reaction increases with the rise of the temperature. The average ratio of the velocities between one temperature and another 10° higher is as 1 : 1.69 (the constants were determined at 0°, 10°, 20°, 30°, and 40°).

Hewlett¹¹ found **lipase** to be **practically absent** from the **normal urine** of dogs, but it appeared after a variety of forms of injury to the pancreas.

Schmitt¹² finds **oxidizing and reducing ferments in the skin**; he suggests that they may play a rôle in the formation of the pigment of the skin. Aloy¹³ reports further observations on similar ferments found in the organs of various animals.

Kastle and McCaw¹⁴ find a **ferment in the liver** of many animals which is capable of **hydrolyzing potassium myronate**. Potassium myronate given subcutaneously was excreted, at least partially, unchanged; given by the mouth, it seemed to be completely hydrolyzed.

¹ Deut. med. Woch., 30, pp. 308 and 352. ² Zeit. f. klin. Med., 51, p. 428.

³ C. R. Soc. Biol., 56, p. 169.

⁴ C. R. Soc. Biol., 56, p. 396.

⁵ Jour. Am. Chem. Assoc., 26, p. 568.

⁶ Univ. Cal. Pub. Path., 1904, p. 33.

⁷ Proc. Roy. Soc., 72, p. 134.

⁸ U. S. Dept. of Agr., Bureau of Animal Indust., Bull. No. 57.

⁹ Monatsh. f. Chem., 25, p. 355.

¹⁰ Am. Chem. Jour., 31, p. 521.

¹¹ Jour. of Med. Research, 11, p. 377.

¹² C. R. Soc. Biol., 56, p. 678.

¹³ Ibid., p. 658.

¹⁴ Am. Chem. Jour., 32, p. 372.

Neilson¹ finds that **platinum black** can affect both the **hydrolysis and the synthesis of ethyl butyrate**. The action is disturbed by many of those "poisons" which have a similar action on lipase. Neilson and Brown² discuss the effects of ions on the decomposition of hydrogen dioxid by platinum black. They state that anions accelerate the action, whereas kations have an inhibitory effect. The action on a given salt would depend, therefore, upon the "relative strength of the ions." They state in a later paper³ that they obtained similar results in experiments on the decomposition of hydrogen dioxid and the hydrolysis of ethyl butyrate by extracts of the pancreas. The explanation of these results is criticized by Loevenhart and Kastle,⁴ who think that the action of inhibitors and accelerators on the catalysis of hydrogen dioxid by metals can, as a rule, be better explained by taking into consideration the chemistry of the individual substances rather than the mere fact that they are in the ionic state; and they state, further, that since monatomic ions differ from atoms only in the possession of an electric charge, ion action can differ from atomic action only in consequence of this change; they have been unable to find any evidence in physiology or pharmacology that an ion ever effects a functional change in consequence of this charge.

Shattock and Seligmann⁵ believe that the appearance of **secondary sexual characteristics** is determined by an internal secretion of the testicle.

From a study of the "critical temperature" (*i. e.*, the temperature at which a ferment is destroyed) Grober⁶ concludes that the **pepsin of the gastric juice** is identical with that of the urine; both are destroyed at 66° C.

Fever.—Mohr⁷ reports experiments on **metabolism in fever**; he finds that the ratio of the carbon to nitrogen excretion in the urine is not markedly different from the normal. Hence he denies that there are marked qualitative alterations of metabolism in fever.

Erben⁸ finds that the products of intermediary **proteid metabolism** (purin-bodies, aminoacids, etc.) are regularly increased in fevers; this also occurs whenever there is a destruction in the body of proteids, as in diabetes, carcinoma, abscesses, etc.

From a study of 2 cases of universal ichthyosis, in which an increase of surrounding temperature caused a rise in the body-temperature without sweat secretion, Linser and Schmid⁹ conclude that in patients with **febrile diseases** having a temperature below 39° to 40° C. the **increased proteid decomposition** must be wholly due to the infection or intoxication and not to the rise of temperature, as heretofore assumed. With a temperature above 40° C. proteid decomposition does take place independent of infection; the excretion of purin-N, ammonia, amino-N, and phosphoric acid increases in a parallel manner. Carbohydrate did not reduce the N-destruction in artificial hyperthermia to the same extent as

¹ Am. Jour. Physiol., x, p. 191.

² Ibid., p. 335.

³ Proc. Roy. Soc., 73, p. 49.

⁴ Zeit. f. klin. Med., 52, p. 371.

⁵ Deut. Arch. f. klin. Med., 79, p. 514.

⁶ Ibid., p. 225.

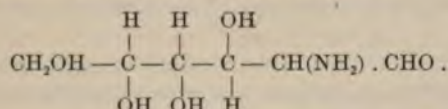
⁷ Science, 19, p. 631.

⁸ Deut. Arch. f. klin. Med., 79, p. 443.

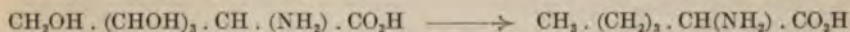
⁹ Zeit. f. Heilk., 25 (F), p. 33.

during a state of normal temperature. The respiratory quotient was diminished in a moderate rise of temperature.

Glucosamin.—Fischer and Leuchs¹ show that by treatment of d-arabinose with ammonia and hydrocyanic acid d-glucosaminic acid is formed, which can be changed by reduction to d-glucosamin. The essential part of the configuration of the latter substance, as well as the position of the amido-group, is thus determined—



The position of the amido-group, however, had been fairly established by Neuberg,² who converted d-glucosaminic acid into α -amido-n-caproic acid.



Tiemann³ also had proved that the configuration is very similar to that of d-glucose by the formation of d-glucosazone from d-glucosamin and phenylhydrazin.

Glucose.—It is perfectly apparent that the excessive quantity of sugar formed in diabetes cannot be attributed to the comparatively insignificant number of carbohydrate groups in the proteid molecule. This has caused many to conclude that proteids contain groups which are not carbohydrate, but which can, under certain conditions, become carbohydrates. Kossel has considered the diamido acids in this connection, calling attention to the fact that they all contain 6 atoms of carbon, and naming them for this reason the hexone bases. Müller and Kraus⁴ have given their attention to leucin as a carbohydrate-former, and the finding of tetroxyamidocaproic acid in the cartilage by Neuberg and Orgler⁵ gives great credence to this view of the matter. Another very important support to the hypothesis is furnished by Neuberg and Langstein,⁶ who find that alanin is in degree a glycogen-former, and that by passage through the organism it is partly changed to lactic acid, which stands in close chemic relation to glyceric aldehyd and glucose.

Meyer⁷ studies the **fate of the diamidoacids in the body**, choosing diamido-propionic acid as the simplest member of the group (since Drechsel's diamidoacetic acid has been shown not to exist⁸), and also on account of its close relation to a large group of physiologically important compounds (serin, alanin, lactic acid, cystin). He finds that after subcutaneous injection the diamidoacid cannot be found as such, but appears in the urine in part as glyceric acid, $\text{CH}_2 \cdot \text{OH} \cdot \text{CHOH} \cdot \text{CO}_2\text{H}$. When it is remembered that this acid is itself reduced in the organism to its aldehyd, and that from this aldehyd as a starting-point Fischer did his remarkable

¹ Ber. d. d. chem. Ges., 36, 24.

² Ibid., 17, 241, and 19, 49.

³ Zeit. f. physiol. Chem., 37.

⁷ Zeit. f. physiol. Chem., 42, 59.

² Ibid., 35, 4009.

⁴ Berl. klin. Woch., Nov. 1, 1904.

⁶ Verhandl. d. physiol. Ges., Berlin, 1903.

⁸ Willstedter, Ber. d. d. chem. Ges., 35, 1378.

synthesis of the sugars, it is not difficult to conceive of the amidoacids as intermediary products in the formation of glucose from proteids.

Lüthje¹ reports experiments in support of the view that **sugar may be formed from proteid**, a view which Pflüger, as is well known, has never accepted as proved. Dogs from which the pancreas was removed excreted large quantities of sugar upon carbohydrate-free diets; in one case the sugar excreted in 19 days was 554 gm. in excess of that corresponding to the greatest amount of glycogen yet claimed to be in the body.

Pflüger² replies to Lüthje, maintaining that proof of the formation of sugar from proteid is still lacking. In cases of severe diabetes he suggests that the **sugar comes from the fat**.

Mohr³ also reports **experiments on the sugar-formation in diabetes mellitus**. The sugar secretion was constantly increased after nutrose and meat in comparison with egg-albumin. Mohr calculates that in 2 experiments there was excreted in the course of 4 to 5 weeks 1300 gm. and 1350 gm. of sugar in excess of what could have possibly been derived from the glycogen in the body. It was found that feeding with leucin caused an increase in the sugar-excretion; hence he thinks that the sugar is formed from aminoacids derived from the proteids. It is thought that in some severe cases of diabetes sugar is formed from fat.

Halsey's⁴ experiments indicate that **leucin**, fed in pure form to phloridzinized dogs, **is not changed into sugar**; he admits, however, that it may play a role in the synthesis of sugar when fed with other end-products of digestion, as in the experiments of Lusk and Stiles.

Embden and Salomon⁵ found that **alanin** caused a marked **increase in the sugar-excretion** when fed to dogs from which the pancreas had been removed.

Pflüger has recently maintained that the increased sugar-excretion observed after the administration of glycerin to phloridzinized animals is due to a "washing-out" of the sugar as a result of the diuresis; Lüthje⁶ produces new experiments in support of the view that there is a formation of **sugar from glycerin**.

Mandel and Lusk⁷ report on a case of diabetes mellitus in which the symptoms were what are ordinarily considered favorable. The **ratio of dextrose to nitrogen** in the urine was, however, 3.65 to 1; this ratio, which has been observed in other cases and is obtained in phloridzinized dogs, represents the maximum output of sugar from proteids and a complete intolerance for carbohydrates. It is probably the worst prognostic sign in diabetes. The patient died in a short time.

V. Moracezewski⁸ found that in general the **excretion of oxalic acid, indican, acetone, and conjugated sulfates in diabetes** was greater on days in which the diet consisted largely of meat than when carbohydrates predominated; the excretion of these substances was still greater under the influence of fat.

¹ Deut. Arch. f. klin. Med., 79, p. 498.

² Arch. f. d. ges. Physiol., 103, p. 1.

³ Zeit. f. klin. Med., 52, p. 337.

⁴ Am. Jour. Physiol., 10, p. 227.

⁵ Beit. z. chem. Physiol. u. Path., 5, p. 507.

⁶ Deut. Arch. f. klin. Med., 80, p. 98.

⁷ Proc. Soc. Exp. Biol. and Med., 1, p. 36. ⁸ Zeit. f. klin. Med., 51, p. 475.

A preliminary report of great interest is made by Beddard, Pembrey, and Spriggs¹ on the **quantity and pressure of carbon dioxid in venous blood** and in the alveolar air in cases of diabetes and diabetic coma. One of the chief arguments for the view that diabetic coma is due to acid intoxication is the low percentage of CO_2 in the blood; this has been interpreted as due to diminished alkalinity of the blood. The above authors consider that the low percentage of CO_2 is due to the hyperpnea; the latter has been considered to be the effect, not the cause, of the reduction of the CO_2 . Blood from cases of diabetic coma is capable of taking up large amounts of CO_2 .

An interesting critical review of the **chemistry of diabetes** is given by Edsall.²

Knöpfelmacher³ found the **assimilation-limit for sugar** extremely high in 2 cases of congenital myxedema; 2 children of 12.5 and 12.2 kilos excreted no sugar after 150 gm. of dextrose. Thyroid treatment lowered the limit to 100 gm. in one case and to less than 50 in the other. In Basedow's disease the assimilation-limit for sugar is often lowered.

Starting from the recent work of himself, of Cohnheim, and of Blumenthal upon the **interaction of ferments in the destruction of sugar**, Croftan⁴ tried the effect of feeding to diabetics an extract of a mixture of pancreas, muscle, and blood coagulated with alcohol. The result was a marked diminution of the sugar-excretion. The limit of assimilation of carbohydrates was raised. He suggests that the extract destroys the sugar, thus giving the sugar-destroying mechanism of the organism a rest.

Glycolysis.—Arnheim and Rosenheim⁵ study the combined action of various gland-extracts (pancreas and muscle, pancreas and liver, etc.) on glucose in an apparatus designed to recover the carbon dioxid formed, and find that a combination of pancreas with any organ extract produces a greater amount of CO_2 than the organ extract alone. After a confirmation of their results by the polariscopic method they conclude that, contrary to Cohnheim, every tissue of the body has a constant power of decomposing glucose, and, in agreement with Cohnheim, that this glycolytic power of various organs is in some unexplained manner increased by the pancreas.

Stoklasa and Czerny⁶ find that there is a **formation of alcohol by various animal tissues** when these are added to a dextrose solution; this property depends upon an enzym. They claim⁷ priority over Cohnheim and Hirsch in the discovery of a glycolytic ferment in the tissues. Cohnheim⁸ and Batelli⁹ claim, however, that Stoklasa's results were due to bacteria.

Austin¹⁰ was unable to determine the **products of the glycolysis** which

¹ Jour. Physiol., 31, No. 5, p. xlv. ² Albany Med. Ann., 25, p. 341.

³ Wien. klin. Woch., 17, p. 144. ⁴ N. Y. and Phila. Med. Jour., 79, p. 882.

⁵ Zeit. f. physiol. Chem., 40, 220.

⁶ Ber. d. d. chem. Ges., 36, p. 662; Cent. f. Physiol., 16, p. 652.

⁷ Arch. f. d. ges. Physiol., 101, p. 311; Cent. f. Physiol., 17, p. 465.

⁸ Zeit. f. physiol. Chem., 42, p. 408. ⁹ C. R. Acad. Sci., 137, p. 1079.

¹⁰ Am. Jour. Med. Sci., 127, p. 832.

occur in blood upon standing. The sugar is not converted into carbon dioxid, oxalic acid, or, apparently, into glycuronic acid.

Glycuronic Acid.—V. Fenyvessy¹ concludes that glycuronic acid is not formed normally in the body, but is found when substances capable of uniting with glycuronic acid are present; it is not dependent upon the presence of glycogen.

Gout.—Kionka found that fowls sickened from gout when fed for some time on raw meat; Bahrmann² confirms this observation, but also finds that this result can be avoided or delayed by the administration of certain alkaline salts. Watson,³ on the other hand, was unable to confirm Kionka's results.

Iodin.—Justus⁴ has continued his investigations on the **distribution of iodine in the body**. He finds this element in every organ. The thyroid contains the most (9.76 mg. in 100 gm.), the subcutaneous fat the least. The liver contains 1.21 mg., the kidney 1.05 mg., the ovary 1 mg., pro 100 gm. He considers untenable those hypotheses which seek to explain the functions of the thyroid by its exclusive iodine-content.

Interesting determinations of the **iodine-content of the thyroid** are reported by Monery.⁵ In Lyons a gram of the thyroid contained on the average 0.631 mg. of iodine; the entire gland, 4.535 mg. In Savoy, where cretinism is endemic, one gram contained but 0.113 mg., or an entire gland, 1.545 mg. The maximum amount of iodine was found at 60 years. In women there seemed to be a storing up of iodine in puberty which disappeared with the first menstruations. Pregnant women seemed to have but little iodine in the thyroid. In the insane there seemed to be a maximum amount in the excitement forms, a minimum amount in the depression forms. In cretinism the relative iodine-content was diminished, although the absolute amount was at times increased.

Chenu and Morel⁶ find a very small percentage of **iodine in the parathyroids** in comparison with the thyroid; they think that the death due to extirpation of the former cannot be attributed to the removal of the iodothyron, and that the functions of the parathyroids are different from those of the thyroid.

Iron.—It has been shown once more—this time by Tartakowsky⁷—that **inorganic iron** is absorbed and directly utilized for the formation of hemoglobin exactly as is the iron of the food. Experiments were made upon dogs; in many cases the animals had been made anemic by bleeding.

The objections of Kutscher and Steudel to the **Kjeldahl method of determining nitrogen** in creatinin, lysin, and uric acid have been met by Folin,⁸ Berger, Fingerling and Morgan,⁹ and by Sørensen and Pendersen.¹⁰ From the work of these and others which might be mentioned there would seem to be no reason why the method should not be applied to these substances.

¹ Arch. int. de Pharm. et de Ther., 12, p. 407.

² Arch. int. de Pharm. et de Ther., 12, p. 421.

³ Lancet, 1904, 1, p. 1352.

⁴ Virchow's Arch., 176, p. 1.

⁵ Jour. de Pharm. et de Chim., No. 6, 19, p. 288; Thesis, Lyons, 1903.

⁶ C. R. Soc. Biol., 56, p. 681; C. R. Acad. Sci., 138, p. 1004.

⁷ Arch. f. d. ges. Physiol., 101, p. 423.

⁸ Loc. cit.

⁹ Zeit. f. physiol. Chem., 39, 329.

¹⁰ Ibid., 39, 513.

Levulinic Acid.—It was formerly supposed that nucleic acids of various origin differed from one another markedly in their hydrolytic products. Certain members of the group were found to produce all 4 of the xanthin bases, others only 3 or 2, while Kossel's adenylic acid (the nucleic acid of the thymus) and Ivar Bang's guanylic acid (an artificial nucleic acid prepared from the pancreas) were supposed to yield only 1 xanthin base. Again, certain nucleic acids were supposed to yield thymine and others uracil, while levulinic acid could be shown as a hydrolytic product of 2 or 3 nucleic acids, and was stated positively to be absent in several cases. The recent work of Levene and others has shown that all nucleic acids yield both guanine and adenine, and it seems highly probable that the other 2 xanthin bases have been found either as a result of alteration of the nucleic acid due to the ferments present in the glands, or to a partial decomposition of guanine and adenine into xanthine and hypoxanthine in the laboratory. So also it has been found that practically all nucleic acids yield both thymine and uracil. Inouye¹ shows that the same uniformity holds with regard to the formation of levulinic acid, and adds 3 nucleic acids to the list of those which contain a group capable of producing this substance on hydrolysis.

Metabolism.—Chittenden² has made a preliminary report on important experiments on the **minimum proteid requirement** of man. The commonly accepted Voit standard of 118 gm. daily or 16 gm. of nitrogen excreted as urea, was found to be 2 or 3 times greater than is necessary to provide for the support of the body even in the case of those who indulge in athletic exercises. The experiments were made on 27 persons and continued for 6 months. Similar results were obtained by Labbe and Morchaisne³ in an experiment in which a vegetable diet was taken.

In **metabolism experiments upon a vegetarian** Hauer⁴ found nitrogen-equilibrium to be maintained on 10.95 gm. nitrogen, 112.2 gm. fat; a total of ca. 2789 calories were taken. Thirty-eight per cent. of the nitrogen of the food and 22 % of the fat appeared in the feces; assimilation, therefore, was very imperfect. The person weighed 64.93 kilos.

Hasselbach⁵ concludes, from **metabolism experiments**, that the child is born with a store of glycogen which serves as the source of food for the first hours. Muscular contractions have a marked effect upon the metabolism; when the child is quiet, the metabolism pro kilo is only slightly greater than that of an adult.

Little or no evidence of the **regeneration of proteid** from its simplest hydrolytic products was obtained by Lesser⁶ in experiments upon dogs. He thinks the products of the pancreatic digestion of fibrin are not utilizable for the maintenance of the nitrogen-equilibrium, while large quantities of the products obtained by a 27 days' peptic digestion with Witte's peptone may serve this purpose. Loewi⁷ (who first maintained

¹ Zeit. f. physiol. Chem., 42, 117.

² C. R. Acad. Sci., 138, p. 1366.

³ Biochem. Centralbl., 2, p. 680.

⁷ Ibid., 46, p. 110.

² Boston M. and S. Jour., 150, p. 518.

⁴ Diss., Freiburg, 1903.

⁵ Zeit. f. Biol., 45, p. 497.

⁶

that these end-products could maintain nitrogen-equilibrium) and Lesser¹ have continued the controversy.

Taylor² makes a preliminary report on very interesting studies on the effect of **salt-free diet**. Such a diet led to marked diaphoresis, soreness, and later twitchings of the muscles, and on the ninth day acetone and diacetic acid appeared in the urine. The salts of the urine diminished; the indican and paired sulfates and ammonia increased.

Wiley³ found no very marked changes of **metabolism after the administration of borax** to man. The elimination of phosphorus was, however, increased. There was also a tendency toward an increase in the total solids excreted in the feces, as had been observed in earlier experiments by Forster and by Chittenden and Gies. Four grams of boric acid a day or its equivalent in borax may be regarded as the limit of toleration; in many cases 3 gm. caused unpleasant symptoms. Half a gram continued for 50 days also caused in some cases disagreeable results. Leclerc and DuBois⁴ publish the results of careful comparative determinations of sulfur and phosphoric acid in foods, feces, and urine in these experiments.

Harrington⁵ found marked lesions in the kidneys of cats which had been fed on **borated food** for 19 weeks.

Milk.—Bunge⁶ publishes the analyses of the **ash of milk and various other food-stuffs**. Milk is poorer in potassium, magnesium, and phosphoric acid than are most foods, while it is richer in calcium. The calcium, in combination with caseinogen, is easily split off by dilute acetic acid. It is suggested that lactose and citric acid assist the solution of calcium phosphate; the amount of citric acid and calcium appear to be proportional.

Filia⁷ is inclined to attribute little importance to the **ferments of milk**; he regards them as excretions rather than as secretions. He thinks the most frequent cause of many of the digestive disturbances of infants is the lack of sufficient activity of the proteolytic enzym of the pancreas.

From experiments on goats from which the mammary glands were removed Porcher⁸ concludes that the **lactose of milk** is formed in the mammary glands from dextrose which is excreted in excess by the liver. He explains the antepartum glycosuria of pregnant women on the supposition that the dextrose is thrown into the blood before the mammary glands have acquired the power to transform it into lactose. The presence of dextrose or of lactose in the urine of cows in certain pathologic conditions is easily explained on the basis of these experiments. Porcher⁹ also finds a hypoglycemia in cows after the injection of phloridzin; there is a corresponding diminution of the lactose of the milk.

Guiraud and Lasserre¹⁰ find, in a number of diseases, both human and bovine, an abnormal **lowering of the freezing-point of the milk**; this is especially marked in tuberculosis.

¹ Zeit. f. Biol., 46, p. 113.

² Jour. Am. Med. Assoc., 43, p. 625.

³ U. S. Dept. Agr., Bureau of Chem., Cir. No. 15.

⁴ Jour. Am. Chem. Soc., 26, p. 1109.

⁵ Am. Jour. Med. Sci., 128, p. 418.

⁶ Zeit. f. Biol., 45, p. 532.

⁷ Biochem. Centralbl., 2, p. 444.

⁸ C. R. Acad. Sci., 138, pp. 833 and 924.

⁹ Ibid., p. 1457.

¹⁰ C. R. Acad. Sci., 139, p. 452.

Amberg¹ discusses the **precipitin reaction of human and cow's lactoserum and caseoserum**. He finds that the reaction depends neither upon the casein being in the form of a calcium salt nor upon the presence of a soluble inorganic calcium salt. No difference was found between lactoserum and caseoserum in their behavior toward their corresponding milk, casein, and lactalbumin, and an interreaction of cow's lactoserum and caseoserum with human milk, casein, or lactalbumin, and vice versa, did not occur.

Nuclease.—Iwanoff² finds that there are present in various fungi (*Aspergillus niger*) enzymes which exert a specific action on nucleic acids. Pure thymus nucleic acid is split up, giving phosphoric acid, which is directly precipitable by magnesia mixture, and xanthin bases directly precipitable by silver nitrate and ammonia. He shows that the enzyme is not trypsin, since it cannot liquefy gelatin, and proposes for it the term "nuclease."

The **nucleic acid** which exists in such large amount in the leukocytes of the thymus was formerly thought to yield only 1 of the 4 xanthin bases (adenin), and for this reason was called adenylic acid. It was subsequently found to yield 2 bases, viz., guanin and adenin. In this respect thymus nucleic acid resembles other nucleic acids, and an anomaly was thus removed. Steudel,³ in a recent communication, without any reference to the 2 attempts mentioned, states that this nucleic acid yields xanthin, hypoxanthin, guanin, and adenin. His method of hydrolysis, however, is new, and leads one naturally enough to suspect that the xanthin and hypoxanthin are formed by the action of his reagents on guanin and adenin, and this especially since recent work in this line would almost warrant the assertion that all nucleic acids, when properly purified, yield only guanin and adenin. Thus from 109 gm. of nucleic acid of the spleen Levene⁴ was unable to obtain a trace of either xanthin or hypoxanthin.

Ivar Bang's guanylic acid, which yields on hydrolysis only one xanthin base, and no pyrimidin derivative, has always been of great interest, and it may be added has given great interest to the nucleoproteid of the pancreas from which it was prepared. Jones and Whipple have found that the nucleoproteid gives both guanin and adenin, and Levene and Stookey⁵ now show that it yields both thymine and uracil.

Alsberg⁶ makes a contribution to the **chemistry of nucleic acids**; he succeeded in obtaining the constituents named by Schmiedeberg, nucleotin and nucleotin-phosphoric acid. Sulfuric or hydrochloric acid split off half of the purin-base from nucleic acid; the other half remained with the nucleotin-phosphoric acid. The latter combination is called heminucleic acid.

Kutscher and Seemann⁷ **oxidized nucleic acid** with calcium permanganate and found adenin, urea, biuret, and fatty acids. No uric acid

¹ Jour. of Med. Research, 12, p. 341.

² Zeit. f. physiol. Chem., 39, 31.

³ Zeit. f. physiol. Chem., 42, 165.

⁴ Am. Jour. Physiol., 12, 213.

⁵ Zeit. f. physiol. Chem., 41, 404.

⁶ Arch. f. exp. Path. u. Pharm., 51, p. 239.

⁷ Cent. f. Physiol., 17, p. 715; Ber. d. d. chem. Ges., 36, p. 3023.

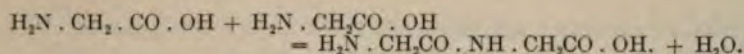
or substances which could be synthetized to uric acid were found. They think that uric acid may be the primary product from which the nucleic acids arise, and not the result of the oxidation of the nucleins, as commonly held. The fact that the ingestion of nucleins leads to an increased excretion of uric acid is explained on the supposition that the nuclein is used up instead of the uric acid.

Observations by Schmoll¹ on 2 cases of **leukemia** indicate that the body is able to effect a **synthesis of nucleic acid** from a purin-free diet.

Polypeptids.—Numerous researches by E. Fischer have shown that upon hydrolysis with boiling acids proteids yield α -pyrrolidin carbonic acid, while in the special case of casein this cyclic acid is produced as well by boiling alkalis, showing with great probability that the substance is a primary decomposition-product and is not formed from some other hydrolytic product by ring closure. In order to furnish further evidence upon this point Fischer and Abderhalden² endeavored to find the acid among the products of a tryptic digestion. Even after digestions prolonged for months, they were unable to find the cyclic compound, but obtained a so-called polypeptid, which obviously withstands the action of the enzym, but which, on hydrolysis with acid, produces about as much α -pyrrolidin carbonic acid as the casein from which it was obtained. In a tryptic digestion of casein the crystallization of tyrosin begins in a few hours; more slowly leucin, alanin, aspartic acid, glutamic acid, and the 3 hexone bases appear. The biuret reaction becomes continually fainter, until at the end of 6 weeks it is no greater than would correspond to the pancreatin alone. Even after a digestion lasting 7 months neither α -pyrrolidin carbonic acid nor phenylalanin could be proved, but a substance is now present which can be precipitated with phosphotungstic acid and thus freed from the monamidoacids. It does not respond to the biuret reaction, and is, therefore, no ordinary peptone. By hydrolysis with acids it yields α -pyrrolidin carbonic acid and phenylalanin, as stated, and, in addition, leucin, alanin, and glutamic and aspartic acids. Whether or not it yields hexone bases was not determined. Similar results were obtained with edestin, egg-albumin, fibrin, and serum-globulin. This discovery stands in contradiction to existing opinions of physiologists who believe that in pancreatic digestion there is a total breaking-down of proteids into simple crystalline derivatives, for hydrolysis under these conditions is only a partial one, and there always remains a very resistant complex, which is not a peptone, but a polypeptid, and contains radicles of all the monamidoacids thus far obtained from proteids. Of special interest is the difference in the manner in which the 2 benzene radicles are joined in the proteid molecule. Tyrosin is always split off first; phenylalanin, not at all. In a tryptic digestion of the peptone from silk fibroin the splitting-off of tyrosin occurs so rapidly that the phenomenon resembles a crystallization of the amidoacid out of water.

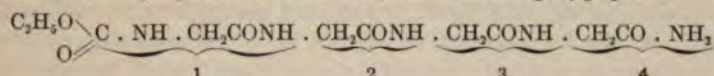
Fischer believes that these **resistant polypeptids** are simply a more or less complicated succession of amidoacids joined in a manner indicated as follows:

¹ Johns Hopkins Hosp. Bull., 15, p. 238. ² Zeit. f. physiol. Chem., 39, 81.



It has been shown by Abderhalden and Bergell¹ that this substance, when injected subcutaneously into rabbits, appears in the urine as glycocoll, thus indicating that dipeptids and perhaps also polypeptids, if absorbed from the alimentary tract, would be hydrolyzed in the organism. Fischer² succeeds easily in making a **synthesis of tripeptids** as diglycyl-

glycin, $\underbrace{\text{NH}_2 \cdot \text{CH}_2\text{CO}}_1 \cdot \underbrace{\text{NHCH}_2 \cdot \text{CO}}_2 \cdot \underbrace{\text{NHCH}_2\text{CO}_2\text{H}}_3$, and by methods which will be found sufficiently complicated for the ordinary reader he has been able to prepare the following unnamable polypeptid:



In this compound there are no less than 4 glycooll molecules united in an anhydrid combination. Fischer hopes to be able to synthesize even more complicated polypeptids which should have something of the nature of peptones.

The work of Fischer and Abderhalden shows that when searching for α -pyrrolidin carbonic acid, the use of the ether method of separation is not admissible, for this process itself would form the cyclic acid from the polypeptid. The researches of Kowalevsky, who found a small amount of the acid in a gastric digestion, is for this reason of no value. In order to ascertain whether any **process of enzym action can produce α -pyrrolidin carbonic acid or phenylalanin from proteids**, Fischer and Abderhalden³ submitted casein—(1) to the action of pepsin; (2) to the successive action of pepsin and trypsin, and examined the products, with the precautions noted above. (1) Gave a trace of the cyclic acid and (2) gave a considerable amount of both acids. Hence the authors are led to the remarkable conclusion that α -pyrrolidin carbonic acid and phenylalanin are not formed at all by the action of trypsin, in traces by pepsin, but in considerable amount by the combined action of pepsin and trypsin in the order in which the 2 enzymes act in the animal organism. This discovery gives food for reflection to those who are convinced of the uselessness in nature of gastric digestion.

Protamins.—At the time of Kossel's original discovery of the protamins as constituents of the spermatozoa of various fishes he was under the impression that these substances contained only 3 of the groups found in the ordinary proteids, and would, therefore, yield only 3 hydrolytic products, viz., arginin, lysin, and histidin. He soon found, however, that clupein would yield amidovaleric acid,⁴ and that cyclopterin responded to Millon's phenol reaction. Markowin⁵ succeeded later in showing tyrosin, a hydrolytic product of this protamin, and Kutscher⁶

¹ Zeit. f. physiol. Chem., 39, 9.

¹ Ber. d. d. chem. Ges., 36, 2094.

³ Zeit. f. physiol. Chem., 40, 215.⁴ Zeit. f. physiol. Chem., 36, 469; see also Schulze and Winterberg, *ibid.*, 25, 300.

⁵ Ibid., 28, 313.

⁶ Ibid., 31, 186.

determined its amount as 8 %. Then followed the isolation of serin and a proof of the existence of the tryptophane group in some of the protamins, and finally the proof of Fischer's¹ α -pyrrolidin carbonic acid among the hydrolytic products of several of the bodies of this class. So that while we admit that the protamins are simpler in their structure than the proteids with which we ordinarily have to deal, they must now be looked upon as sufficiently complicated.

Abderhalden² attempts to show that the **structure of the protamins is even more complicated** than would appear from Kossel's later work. He submitted the products of hydrolysis of salmin to Fischer's well-known method for the separation of aminoacids, and shows with certainty alanin, leucin, and α -pyrrolidin carbonic acid, and also the probable presence of phenylalanin and aspartic acid. He concludes that salmin is not sharply distinguished from the common proteids, but simply stands at the end of a series whose other end is occupied by proteids which yield only a trace of arginin, while the middle of this series is occupied by the histones.

Kossel and Dakin³ are unable to confirm these results. They state positively that **neither leucin nor alanin can be found among the hydrolytic products of salmin**, and that the presence of these substances in Abderhalden's work must be attributed solely to impurities in his salmin preparation. They, moreover, make an exact estimation of each of the hydrolytic products of this protamin, and are able to account for the total nitrogen of the molecule without taking into consideration either of the two debated products.

Thus—Nitrogen of arginin.....	89.2 %
“ “ serin	3.25 %
“ “ amidovaleric acid	1.65 %
“ “ α -pyrrolidin carbonic acid	4.30 %
“ “ known losses	1.60 %
	<hr/>
	100.00 %

This is the only instance in the literature of the complete account of the nitrogen of a proteid.

Kossel and Dakin⁴ have shown in the carp testicle **2 interesting members of the group of protamins**, which they designate as α -cyprinin and β -cyprinin. The former differs markedly from all known protamins in the distribution of its nitrogen. On hydrolysis with boiling acids the substance yields 8.7 % of arginin, while sturin, which of all the protamins contains the smallest number of arginin groups, yields 63.5 % of this compound. α -Cyprinin also contains 30.3 % of its nitrogen as lysin groups, while the largest amount of nitrogen in this form contained in any protamin (sturin) is 8.4 %. Thus α -cyprinin and sturin stand at the opposite ends of a classification of protamins by the distribution of nitrogen. α -Cyprinin gives the biuret reaction and a poor Millon's test, but does not respond to the reaction for tryptophane. Besides the 2 bases mentioned, it yields on hydrolysis a considerable amount of amido-

¹ Zeit. f. physiol. Chem., 40, 311.

² Ibid., 41, 407.

³ Zeit. f. physiol. Chem., 41, 55.

⁴ Zeit. f. physiol. Chem., 40, 565.

valeric acid and a trace of tyrosin, the latter due in all probability to a trace of β -cyprinin present in the material. β -Cyprinin differs from α -cyprinin in that it contains 1.5 % of its nitrogen as tyrosin groups, its arginin is higher (28 %), and its lysin lower (6.6 %), so that it seems highly probable that absolutely pure α -cyprinin would yield more than 30.3 % of lysin and less than 8.7 % of arginin. Kossel and Dakin give reasons for supposing that the existence of the two protamins stands in some relation to the process of ripening.

Hugounenq¹ reports interesting analyses of a proteid derived from the egg of the herring; upon hydrolysis with H_2SO_4 this proteid yielded but 5 % of hexone bases (arginin, etc.), whereas clupein (the protamin obtained from the sperm of the herring) yields 82.2 % of arginin.

Proteids.—Zikgraf² shows that in the progressive oxidation of gelatin with calcium permanganate the failure of the biuret reaction occurs at the point of **maximum production of guanidin**; this may be interpreted as the point where all the arginin has been oxidized. This is in support of Kossel's claim that the protamin nucleus in the proteid molecule is responsible for the biuret reaction.

Plimmer³ obtained **hydrocyanic acid from proteids** by oxidation with Neumann's acid mixture (HNO_3 and H_2SO_4). The amount varies for different proteids but is constant for each proteid.

Gümbel⁴ determined the **distribution of nitrogen** in the molecule of a number of proteids according to Hausmann's method. He thinks the method will be of assistance in differentiating proteids which, by ordinary analysis, seem identical or almost identical.

Posner and Gies⁵ made the important observations that **mucoids combine with other proteids** in acid mediums; this fact explains why the analyses of mucoids have not given concordant figures. These authors⁶ also find that connective-tissue mucoids are digested in pepsin HCl with the formation of albuminate, primary and secondary mucoproteoses, and mucopeptones. A glucothionic acid was separated from the indigestible matter as well as from the proteoses.

Patein and Michel⁷ believe that the term **albumoses** should be restricted to proteid bodies which are not coagulated by heat in a neutral solution. As this is not the case with the body known as Bence-Jones' albumose, they think that this should be classed with albumins and not with albumoses.

Moll⁸ reports finding a **transformation of albumin into globulin** when a faintly alkaline solution of the former was heated for an hour at 60° C.; the albumin passed through the stage of pseudoglobulin to euglobulin. These globulins differed from the albumins in their reaction with salts, their sulfur-content, and their point of coagulation by heat.

Sacconaghi⁹ found that **precipitins** were formed after injection of each of 7 fractions of a peptic or tryptic digestion of serum-albumin.

¹ C. R. Acad. Sci., 138, p. 1062.

² Jour. Physiol., 31, p. 65.

³ Am. Jour. Physiol., 11, p. 404.

⁴ C. R. Acad. Sci., 138, p. 1363.

⁵ Zeit. f. klin. Med., 51, p. 187.

⁶ Zeit. f. physiol. Chem., 41, p. 259.

⁷ Beit. z. chem. Physiol. u. Path., 5, p. 297.

⁸ Ibid., 11, p. 330.

⁹ Beit. z. chem. Physiol. u. Path., 4, p. 563.

The precipitins were specific for the animal but not for the fraction. Similar results were obtained by Levene¹ in experiments with proto-albumoses and deuterioalbumoses.

Ganghofner and Langer² find that when **albumin** foreign to the body is given by the mouth to infants or young animals, it can be detected by the **biologic test** in their blood for 8 days; in cases of gastrointestinal affections the albumin can be detected for a longer period. Antibodies were produced in this way, and it is suggested that harm may be done by the administration of foreign albumin to infants.

Uhlenhuth³ makes further contributions to the **biologic test for proteids**. By immunization with the white of egg a serum is obtained which precipitates this, but not the yolk. A similar relation holds for the crystalline lens and vitreous humor. Especially interesting is the fact that an antiserum for the lens of one animal is equally active toward the lenses of mammals, birds, and amphibia.

Radium, Röntgen Rays, N-rays.—A large number of contributions have been made to the **physiologic action of radium, of the röntgen rays, etc.** Phisalix⁴ found, in a short series of experiments, that exposure of the venom of the viper to the emanations of radium for 58 hours destroys its activity. Henri and Mayer⁵ report experiments on the action of radium upon colloids; they confirm the work of Hardy and others upon the natural division of these bodies into positively and negatively charged ones. The β -rays (negative) precipitate colloidal ferric hydrate (positive), but are without action on colloidal silver (negative); the addition of an electrolyte was, however, necessary. Oxyhemoglobin was converted by these rays into methemoglobin, ferments (invertin, emulsin, and trypsin) became inactive, and red blood-corpuscles were more readily hemolyzed by hypotonic solutions.

Lépine and Boulud⁶ find that the **röntgen rays stimulate the formation of amylase** in the pancreas; sugar-formation and sugar-destruction in the liver and blood are also stimulated by them.

Schmidt-Nielsen⁷ finds that **strong light** has an injurious action upon chymosin, chymosinogen, and antichymosin; the action is exerted almost exclusively by the ultraviolet rays.

The French journals continue to have many articles on the **physiologic action of the so-called "N-rays"**—rays supposed to be emitted by a great variety of bodies, including the human body, and especially nerve-endings, muscles during contractions, etc. Thus Lambert⁸ states that the action of pepsin or pancreatic juice on proteid is accompanied by an emission of these rays which can be detected by means of a screen of phosphorescent calcium sulfid either directly or by photography; control experiments with HCl, HCl-pepsin, etc., are said to have given negative results.

Other writers maintain that acuity of vision, smell, taste, and hearing

¹ Jour. of Med. Research, 12, p. 195.

² Münch. med. Woch., 51, p. 1497.

³ Festschr. z. R. Koch, 1903.

⁴ C. R. Acad. Sci., 138, p. 526.

⁵ Ibid., p. 521.

⁶ C. R. Acad. Sci., 138, p. 65.

⁷ Beit. z. chem. Physiol. u. Path., 5, p. 355.

⁸ C. R. Acad. Sci., 138, p. 196.

are increased by these N-rays; N' rays (rays of a new variety) are stated to have an opposite action. These rays are detected chiefly by subjective tests (changes in the brightness of electric sparks, of phosphorescent screens, etc.) and have been observed only by a small group of French physicists and physicians.

Graetz¹ and Lummer² in Germany and Burke³ in England have been unable to verify the results of the French writers. Burke considers the variations in brightness to be subjective and the result of imagination or of fatigue; he was unable, moreover, to confirm Blondlot's results with photography.

McKendrick and Colquhoun⁴ also report uniformly negative results; they suggest that the results obtained by the French observers may be due to a mental condition or to a dilation of the pupil caused by mental efforts or by close attention.

Secretion.—Fleig⁵ reports experiments with a substance which he calls **sapokrinin**, obtained by extracting the mucous membrane of the upper part of the duodenum with an alkaline soap solution; injected into the veins, this caused a secretion of pancreatic juice. This substance is not identical with secretin (called by Fleig, oxykrinin). It is not destroyed by heating to 100° C., and hence does not belong to the ferments. It is also not a proteid. Further, its action is not specific; the action is the same from whatever animal it is obtained and into whatever animal it is injected.

Bayliss and Starling,⁶ in a lecture on the **chemic regulation of the secretory processes**, give a summary of their previous work on secretin and add some new facts.

Grober⁷ publishes an important paper on the **combination of hydrochloric acid and pepsin**. Among his results may be mentioned the following: dilute HCl has the property of uniting with pepsin, which is adherent to flocculent fibrin. This compound has a higher "critical temperature" (the temperature at which it is destroyed by heat) than the pepsin alone. Pure HCl titrated against alkali with Congo-red for an indicator has a higher titer than the HCl mixed with pepsin; this suggests the possibility of determining quantitatively pepsin by titration.

The **influence of sodium chlorid of the food upon the gastric juice** is discussed by Vincent⁸ and Linossier⁹; the former found that it stimulates the secretion of the gastric juice, whereas the latter states that the question is very complicated; in fact, Linossier found that an excess of NaCl could diminish the HCl secretion.

Meunier¹⁰ judges the **activity of the rennet ferment** of human gastric juice by the amount of milk coagulated by it in 10 minutes. Normally, one volume of gastric juice coagulates 1000 to 2000 volumes of milk; in chronic gastritis and carcinoma this falls to 0 to 100; in alcoholic gastritis, gastric ulcers, etc., to 100 to 500; in various forms of dyspepsia,

¹ Münch. med. Woch., 51, p. 601.

² Nature, 70, p. 198.

³ Jour. de Physiol. et de Pathol. gén., 6, p. 32.

⁴ Arch. f. exp. Path. u. Pharmak., 51, p. 103.

⁵ Ibid., p. 50.

⁶ Physikal. Zeit., 5, p. 126.

⁷ Nature, Apr. 7, 1904, p. 534.

⁸ Proc. Roy. Soc., 73, p. 310.

⁹ C. R. Soc. Biol., 56, p. 9.

¹⁰ Bull. gén. de Therap., 147, p. 638.

to 500 to 1000. The cases of low rennet activity coincide with those in which a milk diet is badly tolerated.

Bickel¹ found, on examination with the **ultramicroscope**, that the **gastric juice** is not a simple solution, but contains an enormous number of particles.

Strontium.—Mendel and Thacher² find that strontium, however introduced into the body, is largely eliminated in the feces. The elimination is slow, and is influenced by the amount of calcium in the food. Strontium is found deposited chiefly in the bones.

Sulfur.—Heffter and Hausmann³ find that when egg-albumin and finely divided sulfur are brought together, H_2S is formed. This reaction is not prevented by boiling nor precipitation with ammonium sulfate. They consider the reaction to be due to the presence, in the proteid molecule, of labile hydrogen atoms; they suggest that many reductions in the body (iodates to iodids, etc.) may be explained in this way.

Pollacci⁴ states that he finds **sulfocyanic acid** in all parts of the animal organism; he attributes important physiologic functions to it. He thinks that this acid converts the mercury of calomel into mercury sulfocyanate and sets mercury free.

Benedix⁵ found it impossible to influence the normal **freezing-point** of the blood by causing profuse **sweating**. In nephritis with an abnormal lowering of the freezing-point of the blood sweating caused it to return to the normal.

Hoelscher⁶ reports an extensive series of analyses of **human perspiration** in health and disease.

J. J. Abel⁷ describes the **action of nitric acid on epinephrin hydrate** (adrenalin), and obtains a basic nitrogenous derivative which possesses many of the chemic characters of the mother-substance. When treated with alkalis it gives off the odor which Abel has frequently referred to in connection with adrenalin as the "coniin-piperidin odor," and forms a well-characterized crystalline addition-product with gold chlorid, whose analysis leads to the formula $C_9H_4N_2O$ for the base itself. Abel considers this substance the key to the further study of the structure and chemic nature of epinephrin hydrate; he shows that it is related to antipyrin, and gives other evidence to show that the substance contains a pyrazolone nucleus. He also notes that while the nitrogen analyses of adrenalin made by Takamine, Aldrich, von Fürth, and Pauly are all higher than his own, they do not agree with one another, and the material used by all these chemists for analysis was probably contaminated more or less with some highly nitrogenous impurity. He therefore stands by the formula $C_{10}H_{13}NO_3 \cdot \frac{1}{2}H_2O$ for epinephrin hydrate.

In order to show his preparations of adrenalin free from ammonium salts Pauly⁸ distilled 2.5 gm. of adrenalin with alkalis. The distillate, which should contain all the ammonia due to the original presence

¹ Münch. med. Woch., 51, p. 1642.

² Am. Jour. Physiol., 11, p. 5.

³ Beil. z. chem. Physiol. u. Path., 5, p. 213.

⁴ Biochem. Cent., 2, p. 603.

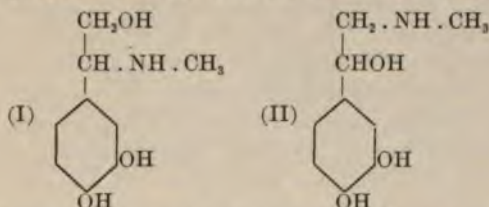
⁵ Deut. med. Woch., 30, p. 233.

⁶ N. Y. and Phila. Med. Jour., 79, p. 296.

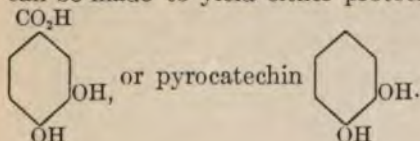
⁷ Ber. d. d. chem. Ges., 37, 369.

⁸ Ber. d. d. chem. Ges., 36, 2945; 37, 1388.

of ammonium salts, was treated with hydrochloric acid and platinum chlorid, and the platinum double salt thus formed was found to have the composition of methylamin platinum chlorid, and to crystallize in the 6-sided plates characteristic of this substance. From this he concludes that his high nitrogen values are not due to ammonium salts, and stands by the formula $C_9H_{13}N_3O$. Assuming this empyric formula to be correct, Pauly proposes one of two structural formulas for adrenalin:



And on the following grounds: 1. When distilled with alkalis, adrenalin yields methylamin, $\text{CH}_3 \cdot \text{NH}_2$. 2. It forms oxalic acid by oxidation, CO_2H . 3. It is optically active $[(\alpha)_D = -43^\circ]$, and must therefore contain an asymmetric carbon atom. 4. According to treatment, it can be made to yield either protocatechuic acid



Pauly calls attention to the fact that cholin, $\text{N} \begin{array}{l} \nearrow \text{OH} \\ \nearrow \text{CH}_3 \\ \nearrow \text{CH}_3 \\ \nearrow \text{CH}_3 \\ \nearrow \text{CH}_2 \cdot \text{CH}_2\text{OH} \end{array}$ and serin,

$\text{CH}_2\text{OH} \cdot \text{CHNH}_2 \cdot \text{CO}_2\text{H}$, two important physiologic chemie compounds, both have the structure $\begin{array}{c} \text{CH}_2 \cdot \text{OH} \\ | \\ \text{CH} \cdot \text{NH} \end{array}$ found in his formula for

adrenalin. When to this is added that Jowett¹ obtained **veratric acid** by oxidation of methylated adrenalin, the evidence in favor of a trisubstituted benzene ring in which the substituting groups occupy the positions 1, 3, 4 as the primary nucleus of adrenalin seems overwhelming. It should be remembered, however, that the **decomposition-products of adrenalin** referred to have been obtained in exceedingly small quantity, and that the structure proposed by Pauly cannot be made to account for the pyrazolone derivative which Abel constantly obtains by the oxidation of adrenalin and which must take first place in any consideration of structure.

Toxins.—Ehrlich's views on the constitution of diphtheria and other toxins have been subjects of active controversy. Arrhenius and

¹ Proc. Chem. Soc., 20, 18.

Madsen¹ claim that the view that these toxins are complete mixtures of toxin, toxoids, toxons, etc., is untenable; they claim that a mixture of toxin and antitoxin follows the Guldberg-Waage law; that the reaction is, therefore, reversible. Nernst² and Michaelis³ consider that the assumption that the reaction is reversible, at least after a very short period, is arbitrary and unsupported by evidence. V. Dungern,⁴ Sachs,⁵ Morgenroth,⁶ and others have brought forward new experiments to show that the reaction is not reversible, and that the existence of toxoids and toxons is very probable. The question as to the existence of toxons seems now, however, to be definitely settled in favor of Ehrlich's views. Calcar⁷ separated from diphtheria bouillon, by special methods of filtration, 2 poisonous constituents; the one (Ehrlich's toxin) killed acutely, the other (Ehrlich's toxon) produced late paralyses and death after several weeks. Ehrlich and his coworkers had been able to show the existence of toxons only by more indirect methods (partial neutralization of toxin with antitoxin), and the lack of direct proof of their existence gave Arrhenius and Madsen's contention that the toxon was only the toxin which was being slowly freed from the antitoxin-toxin combination a certain degree of plausibility. Calcar was also able to show that the toxons have a greater molecular volume than the toxins, but a smaller molecular volume than the proteids.

Vaughan and his coworkers have continued their work on the **chemistry of bacteria**. Wheeler⁸ studied the acid cleavage products of the cellular substance of the typhoid bacillus; she concludes that one or more compound proteids are present. One seems to be of the nature of a phosphorized glycoprotein. Leach⁹ found hexone bases in an acid cleavage product from *Bacillus coli communis*. MacIntyre¹⁰ found an intracellular toxin in *Bacillus pyocyaneus*; the toxicity of the substance was but slightly diminished by heating in the autoclave for 30 minutes to 120° C. One part to 50,000 parts body weight was fatal to guineapigs when given intraperitoneally; subcutaneous injections did not produce immunity to subsequent intraperitoneal injections. A hemolysin was also obtained. A toxin from liver-cells was obtained by Vaughan, Munson, and Spencer.¹¹ Injected intraperitoneally, it killed in the proportion of 1 part to 500. In smaller quantities there is marked emaciation with slow recovery; no immunity reaction was obtained. Vaughan¹² summarizes this work and draws important theoretic conclusions from it. He thinks the colon bacillus is essentially a chemie compound, with at least the following groups: nuclein, amido, diamido, monamido, carbohydrate, toxic, hemolytic, and hemoglobin splitting. The way in which these groups act upon the cells of the body, the formation of antitoxins, etc., are discussed.

¹ Mitt. d. Kaiserl. Gesundheitsamtes, Dec., 1903, 22; Zeit. f. physikal. Chem., 46, p. 415; *ibid.*, 44, p. 1; Cent. f. Bact., 34, p. 7; *ibid.*, 36, p. 2.

² Zeit. f. Elektrochem., 10, p. 377.

⁴ Deut. med. Woch., 1904, Nos. 8 and 9.

⁶ *Ibid.*, 41, p. 526.

⁸ Jour. Am. Med. Assoc., 42, p. 1000.

¹⁰ *Ibid.*, p. 1043.

¹² *Ibid.*, 43, p. 643.

³ Biochem. Centralbl., 3, p. 1.

⁵ Berl. klin. Woch., 41, p. 412.

⁷ Berl. klin. Woch., 41, p. 1028.

⁹ *Ibid.*, p. 1003.

¹¹ *Ibid.*, p. 1075.

Bulloch and MacLeod¹ report experiments on the **chemistry of the tubercle bacillus**. In accordance with the results of others, large quantities of fatty substances were found. The "acid-fast" substance (upon the presence of which the carbolfuchsin stain depends) was found to be an alcohol. Levene² finds that the nucleic acid of the tubercle bacillus is composed in a manner similar to that of the acid present in the animal cell.

Faust³ has isolated **sepsin**, a base discovered 36 years ago by Schmiedeberg, from decomposing brewers' yeast. The formula for the sulfate is $C_5H_{14}N_2O_2 + H_2SO_4$; by repeated evaporation of an aqueous solution cadaverin sulfate was formed. Twenty milligrams injected intravenously into dogs caused death in 4 hours; intense hyperemia of stomach and intestines with numerous ecchymoses was found post-mortem.

Marshall⁴ studied the **venom of the rattlesnake** by means of fractional precipitation with ammonium sulfate. The fraction obtained by adding the salt to 45 % saturation, consisting of euglobulin and pseudoglobulin, was white and nontoxic. The second fraction, obtained from the first by saturation to 60 %, was yellow and toxic. The third fraction, obtained by saturation of the filtrate from the second and consisting of albumin, was nontoxic. The yellow coloring-matter of the second fraction was soluble in absolute alcohol and was nontoxic. No albumoses or peptones were found in the venom.

Flexner and Noguchi⁵ obtained a **crotalus (rattlesnake) antivenin** by immunizing dogs and rabbits with venom in which hemorrhagin and perhaps other locally acting principles had been converted into toxoids.

The work of Osborne and Mendel⁶ does not tend to support the views of those who hold that the **poison of ricin is nonproteid**. An albumin, a globulin, and a proteose were found in the castor-oil bean. The two latter are nonpoisonous; 0.002 mg. of the albumin pro kilo of rabbit was fatal.

Blum⁷ finds, among the products of the **autolysis of lymph-glands**, substances which **neutralize tetanus toxin**. No antitoxins for diphtheria were found.

Atkinson⁸ found that the serum of rabbits immunized with normal globulin gave a **precipitin with diphtheria antitoxic globulin**; a specific antibody differentiating between normal globulin and antitoxic globulin was not obtained. Diphtheria toxin was not freed when immune serum was added to a mixture of toxin and antitoxin.

Tryptophane.—Ellinger makes a most interesting contribution on tryptophane, showing that the commonly accepted structural formula for this substance is not correct, and that the true formula will account for the formation of quinolin derivatives (kynurenic acid). There are 4 known decomposition-products of proteids which contain an indol ring,

¹ Jour. Hyg., 4, p. 1.

² Arch. f. exp. Path. u. Pharmak., 51, p. 248.

³ Jour. of Med. Research, 11, p. 363.

⁴ Beit. z. chem. Physiol. u. Path., 5, p. 142.

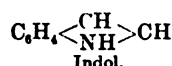
⁵ Jour. of Med. Research, 12, p. 251.

⁶ Science, 19, p. 715.

⁷ Am. Jour. Physiol., x, p. 36.

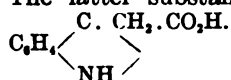
⁸ Proc. N. Y. Path. Soc., 3, p. 193.

viz.: (1) Indol; (2) skatol; (3) skatolcarbonic acid; (4) skatolacetic acid. E. Salkowski assumed that in the proteid molecule there is an atomic complex from which all 4 of these substances are derived; viz.: $C_6H_4<\begin{smallmatrix} C \cdot CH_2 \\ NH \end{smallmatrix}>C \cdot H(NH_2)CO_2H$, to which Nencki, the discoverer of skatolacetic acid, subscribed. This hypothesis was given a verification by Hopkins and Cole,¹ who isolated from the products of a pancreatic digestion of casein a substance having the empiric composition of skatol-amidoacetic acid, and which, when submitted to the action of various bacteria, gave all 4 of the indol derivatives mentioned.² Skatol and indol have both been made synthetically, and they are beyond doubt correctly represented by the formulas—



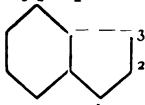
On the other hand, Wislicenus and Arnold made a synthesis of the substance having the structure represented by the formula

$C_6H_4<\begin{smallmatrix} C \cdot CH_2 \\ NH \end{smallmatrix}>C \cdot CO_2H$, but found that the substance was not identical with the skatolcarbonic acid obtained from proteids by putrefaction. The latter substance must, therefore, be represented by the formula

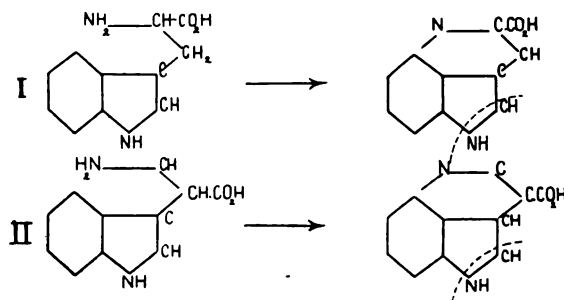


Again, Ellinger³ made a synthesis of a substance

having the formula $C_6H_4<\begin{smallmatrix} C \cdot CH-CH_2 \cdot CO_2H \\ NH \end{smallmatrix}>$ and found this identical with the skatolacetic acid of putrefaction. It can, therefore, scarcely be doubted that in tryptophane the substituting groups occupy the position

designated as 3,  and the substance must be represented by

1 of 4 obvious formulas. Of these, only 2 could yield quinolin derivatives by ring closure, viz.:



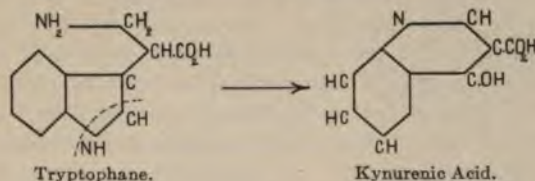
Combination I would give a derivative of α -quinolincarbonic acid, and II, a derivative of β -quinolincarbonic acid.

¹ Jour. Physiol., 27, 418.

³ Ber. d. d. chem. Ges., 37, 1801.

² Ibid., 29, 451.

As a matter of fact, an ingestion of tryptophane is followed by an increase of kynurenic acid, a derivative of β -quinolincarboxylic acid. Tryptophane must, therefore, be represented by formula II, given above, and its transformation into kynurenic acid as follows:



Additional evidence is given to this relation by Hopkins and Cole's recent discovery that tryptophane on oxidation with ferric chlorid produces a substance, C_9H_7NO , which they have reason to believe is one of the unknown oxyquinolins. Thus the existence of the tryptophane group in the proteid molecule, which has already been used to explain so many matters of interest to physiologic chemistry, can now be extended to the 2 quinolin derivatives which have been observed as products of animal metabolism, viz.: the kynurenic acid of the dog's urine and the α -methylquinolin which Aldrich and Jones found present in the secretion of the common skunk.

Tumors.—Beebe¹ found evidence of **autolysis in degenerated malignant growths**; he thinks the main reason why the autolytic products are found in such abundance is the impaired circulation.

In a second communication² Beebe reports analyses of the **inorganic constituents of tumors**; the most interesting result was the finding of much calcium and little potassium in degenerated tumors, and of much potassium and little calcium in rapidly growing ones.

In 10 cases of **carcinoma** Braunstein³ found the **metabolism** to be abnormal in but 3; these showed loss of nitrogen. The excretion of phosphoric acid was parallel to that of the nitrogen.

Ultramicroscope.—Raehlmann⁴ reports **observations on glycogen, proteids, and bacteria by means of the ultramicroscope**. The particles seen in a solution of glycogen are held to be molecular complexes; they become smaller and smaller on the addition of diastase, and finally disappear. When decomposition of a proteid solution begins, numerous ultramicroscopic organisms appear and the proteid particles disappear.

Much, Römer, and Siebert⁵ claim that the ultramicroscope is as valuable for the **quantitative estimation of proteid** in the urine as is the polariscope for that of sugar. Peptic digestion and tryptic digestion alone caused no diminution in the number of visible particles; when tryptic digestion follows peptic digestion, then such a diminution was observed. When an electric current was passed through milk-whey there was a collection of particles at the anode; the anode whey was also strongly bactericidal for the colon bacillus.

¹ Am. Jour. Physiol., 11, p. 139.

² Ibid., 12, p. 165.

³ Zeit. f. Krebsforschung, 1, p. 199.

⁴ Berl. klin. Woch., 41, p. 186.

⁵ Zeit. f. diätet. u. physikal. Ther., 8, pp. 19 and 94.

Biltz and Gatin-Gruzewska¹ studied with the ultramicroscope the precipitation of glycogen by various reagents; they used the pure glycogen recently prepared by one of them.²

Urine.—Oswald³ discusses the **proteids** of the urine of children suffering from **cyclic albuminuria**. Euglobulin and pseudoglobulin were present in greatest amounts; traces of a phosphorized proteid were found. The acetic-acid precipitate (which is often held to be nuclealbumin) consisted largely of euglobulin; to a smaller extent, of fibrinogen. Calvo⁴ also discusses the proteids in the urine. He obtained a precipitate with acetic acid in every albuminous urine after suitable dilution; a similar precipitate was found in all urines after dialysis. This precipitate consisted largely of euglobulin. Euglobulin is especially abundant in febrile albuminuria. Oswald⁵ describes a simple method for the clinical determination of the various proteids in the urine.

The **distribution of nitrogen** in the urine was studied by Landau,⁶ with the following results: Purin-N, 1.01 %; NH₃-N, 2.42 %; urea-N, 90.78 %; aminoacid-N, 2.89 %. The kind of ingested proteid seemed to have little influence, except that the aminoacids were rather high after meat and low after casein. The amount of aminoacids could be increased by the addition of aminoacids to the food. Excessive or deficient nourishment seemed to be without influence on the distribution of nitrogen in the urine.

Beebe⁷ has reinvestigated the **effect of alcohol** upon the excretion of uric acid, with the result that he finds an almost immediate increase in the excretion; he thinks the effect is due to a toxic action on the liver, whereby the oxidation of uric acid, derived from its precursors in the food, is interfered with.

Mendel and White⁸ produce new experiments in support of the view that **allantoin is an intermediary product** in the destruction of uric acid in the body. After the intravenous injection of urates in the cat and dog there was an excretion of allantoin. Sulfonal (a liver poison) markedly diminished the excretion, and probably the formation, of allantoin.

Rockwood⁹ confirms the view of Burian and Schur that the **elimination of the endogenous uric acid** in man is approximately constant for a given individual.

Mandel¹⁰ finds that the **excretion of alloxuric bases** bears a direct relation to the elevation of temperature in aseptic fevers; also that the subcutaneous injection of xanthin or the administration of coffee causes a rise of temperature. He thinks these bodies play an important role in the etiology of fever.

Murray¹¹ expresses preference for the **salicylsulfonic acid test for albumin** in the urine, and gives exact directions for performing it.

¹ C. R., 139, p. 507.

² Beit. z. chem. Physiol. u. Path., 5, p. 234.

³ Zeit. f. klin. Med., 51, p. 502.

⁴ Deut. Arch. f. klin. Med., 79, p. 417.

⁵ Am. Jour. Physiol., 12, p. 85.

⁶ Am. Jour. Physiol., 10, p. 452.

⁷ Arch. f. d. ges. Physiol., 102, p. 569.

⁸ Münch. med. Woch., 51, p. 1514.

⁹ Am. Jour. Physiol., 12, p. 13.

¹⁰ Am. Jour. Physiol., 12, p. 38.

¹¹ Brit. Med. Jour., 1904, i, p. 882.

Bondi¹ recommends that **Ehrlich's diazo-reaction** be made upon filter-paper instead of in the test-tube. Gualdi² found the diazo-reaction in the urine in pneumonia and in putrefactive processes in the intestines. He thinks the reaction depends on phenol groups freed by proteid decomposition. Urine containing phenol gives the reaction.

Long³ has continued his investigations on the **relation of electric conductivity of urine to its chemic composition**. In his previous work he showed that the conductivity of urine due to metabolic products can be approximately found by subtracting the conductivity due to the sodium chlorid from the observed conductivity of the urine. In this paper he determines the effect of other substances occurring in the urine (urea, ammonium sulfate, and disodium hydrogen phosphate) on the conductivity of sodium chlorid. These substances decrease the conductivity of the sodium chlorid, so that to find the conductivity of the constituents of urine other than sodium chlorid it is necessary to diminish the conductivity of a solution of sodium chlorid of the same strength as that of the urine by about 3 %, and to subtract this corrected salt conductivity from the observed urine conductivity.

Chiantante⁴ reports obtaining **alimentary levulosuria** in 9 of 11 cases of diseases of the liver; alimentary glycosuria was obtained in but 2 of the 11 cases. Chajes⁵ has summarized the cases in which alimentary levulosuria has been produced in liver affections; 86.9 % of 84 persons known to have such affections responded positively to the test, while only 15 % of 99 persons free from any liver affections responded positively. He has tested 21 persons free from liver disease; he found a positive result in but 1 case, and therefore agrees with Strauss as to the diagnostic value of the test. Similar observations are reported by de Rossi.⁶

Oswald⁷ discusses the question as to whether there is a **physiologic albuminuria**. The appearance of albumin in otherwise healthy individuals occurs chiefly after overfatigue and is often accompanied by acute dilation of the heart. The albumin found in these cases is a mixture of globulins often without any serum-albumin at all. Since serum-albumin diffuses much more readily through animal membranes than does serum-globulin, the view of those who attempt to explain the phenomenon as being simply due to a less efficient "renal filter" is untenable. In cases of acute parenchymatous nephritis also the first albumin to appear is euglobulin, whereas this is rare in the chronic forms. Hence Oswald considers that the so-called physiologic albuminuria is usually due to distinct parenchymatous irritation.

Cariot⁸ reports a case of the condition known as **emulsion-albuminuria**; the urine has a milky appearance, similar to that caused by fat, but this is due in reality to the presence of proteid in a colloidal state.

Gies⁹ found in the "ureine" of Moor¹⁰ urea, creatinin, pyrocatechin,

¹ Zent. f. inn. Med., 25, p. 257.

² Riforma Medica, 19, p. 27; Biochem. Cent., 2, p. 406.

³ Jour. Am. Chem. Soc., 26, p. 93.

⁴ Biochem. Centralbl., 2, p. 613.

⁵ Riforma Medica, 20, No. 27; Jour. Am. Med. Assoc., 43, p. 1097.

⁶ Münch. med. Woch., 51, p. 654.

⁷ Jour. Am. Chem. Soc., 25, p. 1295.

⁸ Deut. med. Woch., 30, 896.

⁹ Med. Rec., 64, p. 773.

¹⁰ Zeit. f. Biol., 44, p. 123.

purin-bodies, phenol, alkaloidal substances, and inorganic salts; Haskins¹ finds a large amount of urochrome.

Santini² attributes the **chlorid retention in pneumonia** to the formation of organic chlorin compounds; these can be broken up by prolonged treatment with soda.

Vournasas³ gives a **test for acetone** in the urine: 1 gm. iodine; 0.5 gm. potassium iodide, and 5 gm. methylamin are dissolved in water; the urine is boiled with this solution. Acetone, 1:100,000, gives the odor of isonitril; lactic acid, alcohol, and chloroform give the same reaction.

Jolles⁴ describes an improvement in his method for detecting **bile-pigments** in the urine; 0.1 mg. bilirubin in 100 cc. urine could be detected.

Gröber⁵ reports the occurrence of **indigo-red** in the freshly voided urine of a nephritic patient; the dye could be shaken out of the urine directly by chloroform or ether.

Underhill⁶ finds that the **urinary indican** is much diminished by a diet in which gelatin replaces meat; this is in accord with the fact that gelatin does not give the reaction for tryptophane, the chief precursor, according to Ellinger and Gentzen,⁷ of indol.

Moraczewski⁸ found the **urinary ammonia-excretion** in a case where there was evidence of scanty formation of bile to be 5 to 7 times as great as normal, amounting in fact to 7 % to 15 % of the total nitrogen excretion. This agrees with the results of animal experiments in which the liver was artificially eliminated from the circulation.

Steinitz⁹ finds that an increase in the fat of the food leads usually to an **increased ammonia-excretion** in urine, the NH_3 excretion being at times almost doubled. The ammonia is formed to neutralize the acids split off from the fat. The observations were made on children.

Krüger and Reich¹⁰ propose the following modification of Wurster's method for the **determination of ammonia in urine**: 25 cc. of urine, 15 cc. of alcohol, and 10 cc. of milk of lime are placed in an ordinary round-bottomed flask which is connected with a small Pelligot tube containing 25 cc. of $\frac{N}{10}$ hydrochloric acid, and the system is exhausted with an ordinary air-pump. The ammonia from the ammonium salts, but from no other constituents of the urine, rapidly passes over and is absorbed in the bulb, while the alcohol prevents foaming, which has hitherto been the only objection to distilling under diminished pressure. In case the urine contains albumin, 100 cc. is treated with a gram of powdered citric acid and 0.5 gm. of picric acid; 25 cc. of the filtered fluid is treated with 0.5 gm. of powdered barium hydroxid and the distillation carried on as above. The older method of Schlössing is claimed to be useless for clinical purposes, since its execution requires 3 to 8 days and there is no way of telling when the process is at an end.

¹ Am. Jour. Physiol., 12, p. 162.

² Riforma Medica, 1903, 18; Biochem. Centralbl., 2, p. 439.

³ Bull. de la Soc. chim., Paris, 31, p. 137.

⁴ Deut. Arch. f. klin. Med., 78, p. 137.

⁵ Am. Jour. Physiol., 12, p. 176.

⁶ Zent. f. inn. Med., 25, p. 185.

¹⁰ Zeit. f. physiol. Chem., 39, 165.

⁷ Münch. med. Woch., 51, p. 61.

⁸ Beit. z. chem. Physiol. u. Path., 4, p. 171.

⁹ Zent. f. inn. Med., 25, p. 81.

INDEX.

- ARBASIA and Tripold on influence of various factors on excretion of urine, 204.
- Abbe (R.) on treatment with radium, 503.
- Abbott (S. W.) on decrease of consumption in New England, 584.
- Abderhalden on protamins, 623; on structure of protamins, 644.
- Abderhalden (A.) on hemophilia, 342.
- Abderhalden (E.) on alcohol, 536.
- Abderhalden and Fischer on polypeptids, 642; on process of enzym action in producing α -pyrrolidin carbonic acid or phenylalanin from proteids, 643.
- Abdomen, distention of, in pneumonia, 50; vocal fremitus of, 170.
- Abdominal lymph-glands, syphilis of, 200; pain, 214; in pleurisy, 162; reference to, in pneumonia and pleurisy in children, 264; trouble, thoracic disease simulating, 51.
- Abel (J. J.) on action of nitric acid on epinephrin hydrate, 648.
- Abnormalities of gastric secretion, 172.
- Abortive pertussis, 246.
- Abrahams on sea-bathing in skin diseases, 450.
- Abram on chronic interstitial nephritis, 216.
- Abramow and Samoilowicz, biliary capillaries and icterus, 358.
- Abrams (A.) on cardiopneumonia, 146; on cardio-splanchnic phenomenon, 170.
- Abrikossoff on multiple myeloma, 319.
- Abscess, multiple, of lung, in children, 266; of liver, 200; leukocytosis in, 200; of lung in children, 266; on thigh in typhoid fever, 20; subcutaneous, chronic, acid-proof bacilli in pure culture in, 306.
- Absorption, effect of adrenalin on, 472; in chronic habitual constipation, 188; influence of adrenalin on, 534; of albumose, 535; of fat, 534; after ligation of ducts of pancreas, 633; of nutrient enema, 631; physiology, 534.
- Acanthosis nigra, 441.
- Accessory pancreas, 361.
- Accident, disability from, medicolegal aspects, 553; paralysis agitata after, 409.
- Acetanilid cyanosis, differentiation from chronic cyanosis with polycythemia and enlarged spleen, 127.
- Acetanilid habit, 571.
- Acetone, excretion in diabetes, 636; formation and excretion of, influence of fats on, 354; in urine, test for, 656.
- Acetonuria, relation to diet, 108.
- Achylia gastrica, absorption of albumin in, 177.
- Acid, arsenous, in sleeping-sickness, 483; boric, 485; as preservative, 611; poisoning from, 485; carbolic, 486 (see also *Carbolic acid*); cinnaemic, 487; in tuberculosis, 487; contents of bread, 608; diacetic, in recurrent vomiting in children, 272; glycuronic, 638; excretion of, in fever, 81; guanylic, 641; homogentisic, in urine of alkaptonuria, 623; hydrochloric, and pepsin, combination, 647; excessive amount, in gastric carcinoma, 180; in lupus, 451; hydrocyanic, from proteids, 645; lactic, in pruritus in children, 442; levulinic, 639; nitric, action on epinephrin hydrate, 648; nucleic, chemistry, 641; oxidized, 641; thymus, 641; xanthin bases of, 625; nucleic, 500; before operation, effect of, 500; osmic, 500; in trifacial neuralgia, 385, 500; oxalic, excretion in diabetes, 636; quinic, 501; in gout, 501; salicylic, and quinin, in malaria, 70; salicylsulfonic, test, for albumin in urine, 654; secretion of, by kidney, 539; skatolacetic, 652; skatolcarbonic, 652; sulfocyanic, 648; sulfurous, as food-preservative, 610; uric, endogenous, elimination of, 654; excretion of, effect of alcohol on, 654; veratric, by oxidation of methylated adrenalin, 649.
- Acid-intoxication, chronic, from meat-diet, 93; cryptogenic, 108; sui generis, 108.
- Acidity of milk, 231; of urine, epilepsy and, relation, 414.
- Acid-proof bacilli in pure culture in subcutaneous abscess, 306.
- Acids, aromatic, destiny, in alkaptonuria, 623; fatty, higher, synthesis of, in liver, 632.
- Acidulated fat-free milk in gastro-enteritis of infants, 236.
- Acne, röntgen rays in, 507, 508; rosacea, cadmium iodid in, 451; staphylococcus vaccine in, 453; vulgaris, röntgen rays in, 455.
- Acoustic nerve, neurofibroma of, 389.
- Actinotherapy, 470; in alopecia areata, 460; in carcinoma, 460; in epithelioma, 460; in lupus erythematosus, 460; in rodent ulcer, 460; in rosacea, 460; in skin diseases, 459; in telangiectasis, 460; in vascular nevi, 460.
- α -cyprinin, 644.
- Adams (E. W.) on organotherapy in Addison's disease, 99; on suprarenal extract in Addison's disease, 475.
- Adams (J. L., Jr.) on tropical cutaneous myiasis in man, 426.
- Adams (S. S.) on multiple abscess of lung in child, 266; on typhoid fever in children, 238.
- Adamson on multiple lupus, 431.
- Adams-Stokes disease, arteriosclerotic, 141; bradycardia with, 142; neurotic, 141; post-febrile, 141.
- Addison's disease, 99; adrenalin in, 99, 475; destruction of chromatin system in, 99; organotherapy in, 99; suprarenal therapy in, 99.
- Adenase, physiologic chemistry, 626.
- Adenitis, tuberculous, röntgen rays in, 508.
- Adenoma of hepatic cells, 360.
- Adenomyoma of pylorus, 357.
- Adherent prepuce, reflex disturbances with, in children, 285.
- Adler on cardiac syphilis, 148.
- Adler and Adler on test for blood, 626.
- Adolescent insanity, katatonic form, 419.
- Adonidin, 471.
- Adrenalin, 472; action of nitric acid on, 648; action of, on blood, 336; and cocaine hydrochlorate in hemorrhoids, 474; and cocaine in operations, 472; and cocaine, value of combining, 472; and peptone, action of systemic circulation, 526; chlorid in asthma, 161; effect on absorption, 472; effect on eye, 538; effect on movements of intestine, 532; effect on uterus, 541; excretion of sugar after injections of, and influence of artificially produced fever, 355; free from ammonium salts, 648; in Addison's disease, 99, 475; in ascites, 474; in asthma, 474; in atony of bladder, 474; in atony of stomach, 474; in hemorrhage, 473; in pericarditis, 474; in pleurisy, 474; in shock, 474; influence on absorption, 534; influence on blood-corpuscles, 521; methylated, veratric acid by oxidation of, 649.

- Adrian on polyarticular disease with psoriasis, 105.
- Adriance on deficient proteids in infant-feeding, 233.
- Adulteration of food, 609.
- Aerophagia, 171.
- Africa, trypanosomiasis in, 72; typhoid fever in, 18.
- Agglutination in diagnosis of cholera, 63; in scarlet fever, 239; of streptococci, immunity against, 332; of tubercle bacillus, variations in, 296; of typhoid bacilli in proteus and staphylococcus infections, 331.
- Agglutination-test for blood, 627; in typhoid fever, 24.
- Agglutinogens, 521.
- Agote on congenital myxedema, 274.
- Agricultural use of house refuse, 599.
- Agurin, influence upon kidneys, 221.
- Ahrens on röntgen rays in leukemia, 510.
- Ainley, McCrae, and Fyshe on lobar pneumonia, 49.
- Air exhaled by consumptives, 584; expired, in tuberculosis, 33; hot-, dry, in Bright's disease, 221.
- Akromegaly and tumor of hypophysis, anatomic relation, 344; without, 406.
- Alanin causing increase in sugar-excretion, 636.
- Albers-Schönberg on röntgen rays, 506.
- Albu and Calvo on proteids absent from feces, 631.
- Albumin, absorption of, in achylia gastrica, 177; absorption of, in disturbed gastric secretion, 177; biologic test for detecting, 646; decomposition of, influence of carbohydrates on, 177, 178; eggs-, infantile urticaria from ingestion of, 436; in body-fluids, refractometric determinations of, 110; in urine, salicylsulfonic acid test for, 654; reactions for, influence of concentration of urine on, 203; serum-, 208; serum-, in stomach-contents, in diagnosis of gastric carcinoma, 181, 182; transformation into globulin, 645.
- Albuminuria, 208; age in prognosis of, 212; chronic nephritis without, 217; cyclic, 211; cyclic, in children, 281, 282; cyclic, in children, movable kidney in, 282; cyclic, proteids in urine of children with, 654; cyclic, relation to changes in circulation, 210; electricity in, 221; emulsion-, 212, 655; functional or physiologic, 211, 212; in apparently healthy, 212; in tuberculosis, 41; of puberty, 209; orthostatic, movable kidney and, relation, 210; physiologic, 655; physiologic or functional, 211, 212; transient, frequent recurrences, 211.
- Albumose, absorption of, 535; hypoleukocytosis from, 522; influence on blood-corpuscles, 521.
- Albumoses, 645.
- Albumosuria, 207; Bence-Jones, 207; myelopathic, reactions from bone-marrow in, 208.
- Alcohol, 475; action on muscular energy, 476; action on shock, 476; as stimulant, 613; caffeine in destroying appetite for, 573; chronic gastritis from, 173; effect on excretion of uric acid, 654; food value, 608; formation of, by animal tissues, 637; in pneumonia, 50; influence in syphilis, 445; physiologic action, 475; physiology, 536; produced by pancreatic enzyme, 85.
- Alcoholic delirium, protracted, 420; fermentation, 84.
- Alcoholism as cause of crime and insanity, 558; disease of corpus callosum from, 398; medico-legal aspects, 558; strychnin in, 512.
- Alcohols, bactericidal and growth-retarding properties, 596.
- Aldrich (C. J.) on chorea major and pseudo-chorea, 254; on leukonychia striata arsenicalis transversus, 434; on nervous complications of variola, 364; on thrombosis of jugular veins, 159.
- Aleppo boil, protozoa in, 427.
- Alexander (A.) on mitral stenosis, 145.
- Alexander (W.) on vocal fremitus of abdomen, 170.
- Alexander-Katz on gastric carcinoma, 184.
- Alexandrowitch and Kulialko on movements of intestine, 532.
- Alfaro on tuberculosis in children, 249.
- Alimentary glycosuria, 655; condition analogous to, 627; hypersecretion, 172, 173; levulosuria in disease of liver, 196; tract, diseases of, in children, 255; tuberculosis in children, 248.
- Alimentation, rectal, continuous, apparatus for, 180.
- Alkalinity of blood, determining, Dare's instrument for, 109; effect of altitude on, 627; red cells and, 109.
- Alkan and Arnheim on theocin in dropsy, 514.
- Alkaptonuria, 206; destiny of aromatic acids in, 623; ochronosis in, 206; urine of, homogentisic acid in, 623.
- Allan on tubercle bacilli on public-house floors, 585.
- Allantoin, 654.
- Allaris on suppurative thyroiditis, 245.
- Allbutt on aortitis, 155.
- Allen on detecting cholin in blood, 629.
- Allen (C. W.) on high-frequency currents in treatment of skin diseases, 463.
- Allingham on treatment of anal pruritus, 443.
- Alloxuric bases, excretion of, 654.
- Alopecia areata, actinotherapy in, 460; inoculations in, 429.
- Alpha rays, 502.
- Alsberg on chemistry of nucleic acids, 641.
- Altitude, effect on alkalinity of blood, 627; high, changes in blood produced by, 110; high, influence of, on cardiac disease, 148.
- Alvanzino on tuberculous meningitis, 389.
- Alveolar angiosarcoma, primary multiple, of liver, in child, 321.
- Amberg on precipitin reaction of human and cow's lactoserum and caseoserum, 641.
- Amebic dysentery, 191; cramp in muscles in, 192; infection, 191.
- America, *Stegomyia fasciata* in, 60.
- Amidoacids, free, in blood, in acute yellow atrophy of liver, 198.
- Amidon and Getman on gouty phlebitis, 95.
- Aminoacids in acute yellow atrophy of liver, 623; physiologic chemistry, 623.
- Amistani on glycerinated bone-marrow in rachitis, 279.
- Ammonia, excretion of, in urine, 197; excretion of, urinary, 656; in phosphaturia, 205; in urine, determination, 356.
- Ammonia-nitrogen of urine in biliary calculus, 197.
- Ammonuria with latent phosphaturia, 205; with manifest phosphaturia, 205; without phosphaturia, 205.
- Amniotic fluid as infecting agent in children, 225.
- Amoeba coli, life-cycle of, 191.
- Amputation of arm, medicolegal aspects, 549.
- Amucano on digitalis in pneumonia, 492.
- Amyl nitrite in hemoptysis of tuberculosis, 45.
- Amylase, action of röntgen rays on formation of, 646.
- Anal pruritus, 443; with hemorrhoids, treatment, 443.
- Anatomic preparations, method for preservation, 323.
- Anders on relation between typhoid fever and acute tuberculosis, 35.
- Anderson (H. B.) on arteriosclerosis, 153.
- Anderson (J. F.) on spotted fever of Rocky Mountains, 70.
- Anderson and Langley on regeneration of nerve-fibers, 540.
- Anemia, chlorotic, in children, 269; Egyptian, bilharzia infection as cause, 79; eosinophilia in, 226; from *Tenia solium*, 228; in Porto Rico, 226; miner's, hookworm disease and, 600; pernicious, 116 (see also *Pernicious anemia*); röntgen rays in, 114; secondary, in children, 269, 270; splenic, 124 (see also *Splenic anemia*).
- Anesthesia, cutaneous, postoperative, field of diagram showing, 386; intrabuccal field, 387; scopolamin-morphin, 511.
- Anesthesin, 476; in seasickness, 477.
- Anesthetic, stovaine as, 512.
- Aneurysm, aortic, 157 (see also *Aortic aneurysm*); gelatin in, 494; in tabes, 380; thoracic, potassium iodid in, 196.

- Angina pectoris in chronic aortitis, 155; in mitral stenosis, 145.
- Angiosarcoma, alveolar, primary multiple, of liver, in child, 321.
- Anilin dyes, 611; poisoning, 566.
- Animal heat, 539; thermostat, 540.
- Animals, domestic, plague in, 61; slaughtering, humane methods, 612.
- Ankle, sprained, and fractured coccyx, damages for, 555.
- Ankylostoma duodenale, 222; in bilharzia disease, 78.
- Ankylostomiasis, Filix mas in, 227; in Scotland, 227.
- Anomalies in genital apparatus as cause of chlorosis, 116; of chorda tendinea, 348.
- Anorexia in diphtheria, 243.
- Anthony on developmental defects of skin and their malignant growths, 438.
- Anthrax in skin diseases, 452; spores, duration of life, 307.
- Anthropoid apes, syphilis in, 444.
- Anticholera serum, 477.
- Antidysenteric serum, 477.
- Antihemolysis and kidneys, relation, 627.
- Antimonial and lead poisoning from use of linotype, 435.
- Antiperistalsis of stomach, 171.
- Antiplague serum, 477; Yersin's, 477.
- Antipneumococcal serum in pneumonia in children, 264.
- Antiscorbutic treatment of sprue, 188.
- Antiseptic, inefficiency of ferrous sulphate as, 594.
- Antiseptics in tuberculosis, 45.
- Antiserum, immunized, for identifying blood-stains, 573.
- Antisteapsin, 633.
- Antistreptococcus serum, 478; in acute rheumatism, 480; in pernicious anemia, 118; in puerperal sepsis, 479; in rheumatism, 55; in scarlatina, 240; in scarlet fever, 479; in streptococcus endocarditis, 479; in tuberculosis, 479; in variola, 57, 479; polyvalence, 329.
- Antitoxin and toxin of diphtheria, action on blood and hematopoietic organs, 330; diphtheria, 480; diphtheria, immunization with, 588; diphtheria, prophylactic injections of, 244; diphtheria, results from, 587; Dunbar's, 494; dysentery, 192; hay-fever, 494; intraneural injection of antitoxin in, 401; tetanus, 513; treatment of tetanus, 400.
- Antitoxins, 325.
- Antituberculous serum, 481; production, 46.
- Antityphoid serum, 482; Jez's, 26.
- Antivenin, 482; croctalus, 651.
- Aorta, syphilis of, 148; tortuosity of, 156.
- Aortic aneurysm, 157; gelatin-injections in, 157; iodipin-injections in, 158; syphilitic, 157; thoracic, potassium iodid in, 158; insufficiency, 145; insufficiency, nephritis in, 145; murmur, diastolic, 146; valve, normal histology, 347; valve, sclerosis of, 347.
- Aortitis, 155; chronic, angina pectoris in, 155; chronic, bruit de tabourka in, 156; chronic, physical signs, 155, 156; chronic, pressure-symptoms in, 155; chronic, symptoms, 155;
- Apes, anthropoid, syphilis in, 444.
- Apex of heart, displacement of, in children, 267.
- Apex of lungs, percussion of, in tuberculosis, 36.
- Aphasia in measles, 245; in scarlatina, 240.
- Aplasia of thyroid gland, 343.
- Aplopappus Baylahuen in dysentery, 195.
- Apocynum cannabinum, 483.
- Apolant on urinary gravel, 218.
- Apoplectic conditions, restlessness in, 396.
- Appendicitis, 188; acute, diagnosis and indications for operation, 190; and influenza, 188; embolism of right femoral artery in, 189; frequency, 189; from meat-autointoxication, 188; glycogen reaction in blood in, 116; obliterative, 189.
- Arginase, physiologic chemistry, 622, 623.
- Ariythmia, cardiac, nervous and organic, 137.
- Aristochin, 483; in asthma, 483; in whooping-cough, 483.
- Arloing and Courmont on agglutination of tubercle bacilli, 296.
- Arm, amputation of, medicolegal aspects, 549; rodent ulcer on, 433.
- Armies, European, health of, 614.
- Army, British, prevalence of venereal and other diseases in, 615.
- Arnberg on sublingual growths in infants, 256.
- Arndt on physostigmin in postoperative intestinal paralysis, 500.
- Arnheim on pertussis, 246, 309.
- Arnheim and Alkan on theocin in dropsy, 514.
- Arnheim and Rosenheim on glycolysis, 637.
- Arnsperger on aortic aneurysm, 157.
- Aromadendral, 493.
- Aromatic acids, destiny, in alkaptonuria, 623.
- Aronheim on adrenalin and cocaine, 472; on atropin methylbromid, 485.
- Aronsohn on excretion of sugar after injections of adrenalin, 355; on mesotan in rheumatism, 55.
- Aronson on Sahli's test-meal, 168; on serum, 478.
- Arraga on interstitial nephritis in children, 283.
- Arrhenius and Madsen on constitution of diphtheria and other toxins, 649, 650.
- Arsenic, 483; in food, 624; in herpes zoster in children, 293; in infectious chorea in children, 255; in polycythemia, 483; physiologic chemistry, 624; poisoning, 569, 570.
- Arsenite of copper in marasmus, 276.
- Arsenous acid in sleeping-sickness, 483.
- Arterial atheroma, experimental, 345; hyper-tonus, 152; sclerosis, 152; stenosis, 158; thrombosis, gonorrheal, 58.
- Arteries, diseases of, 151.
- Arteriosclerosis, 152; and diabetes mellitus, relation, 87; blood-pressure in, 152, 154; edema in, 153; intermittent renal insufficiency in, 155; of spinal cord, 381; origin, 345; over-feeding as cause, 154; systolic murmur at apex of heart in, 131.
- Arteriosclerotic Adams-Stokes disease, 141.
- Arthritis deformans, 99; differentiation from acute articular rheumatism, 101; from statistical standpoint, 101; subcutaneous fibroid nodules in, 101; gonorrheal, in children, 285; influenzal, 57; pneumococci, 53; purulent, in cerebrospinal meningitis, 57; rheumatoid, blood in, 190.
- Arthropods, influence of mechanic forces on, 338; significance of blood-corpuscles in coagulation of blood in, 338.
- Ascaris lumbricoides, 222, 224.
- Ascherson on heart-murmurs, 132.
- Ascites, adrenalin in, 474; from syphilis of liver, 200.
- Ash of milk, 640.
- Ashby on hydatid cyst of brain in child, 291.
- Asher on alcohol as antidote in carbolic-acid poisoning, 476.
- Ashford on filariasis in Porto Rico, 77.
- Ashford and King on uncinariasis in Porto Rico, 226.
- Aspergillus fumigatus, 317; fumigatus, toxic properties, 306; in pellagra, 317.
- Asphyxia, viscosity of blood in, 519.
- Aspidium, 483; blindness from, 483, 484.
- Aspidospermin, 484; effect on respiration, 484.
- Aspiration of pericardium in pericarditis, 144.
- Aspirator, 164.
- Aspirin, 484; as cardiac depressant, 484; in chorea, 484; in diabetes mellitus, 484; poisoning, 571; skin eruptions from, 571.
- Assimilation-limit for sugar, 637.
- Asthma, 161; adrenalin chlorid in, 161; adrenalin in, 474; aristochin in, 483; atropin methylbromid in, 485; intratracheal injections in, 161; migraine and, mechanism, 416; suprarenal spray in, 161.
- Ataxia, family, 383; hereditary, 383; locomotor (see also *Locomotor ataxia*).
- Atheroma, arterial, experimental, 345.
- Atkinson on precipitin with diphtheria antitoxic globulin, 651.
- Atony, gastric, 175; of bladder, adrenalin in, 474; of stomach, suprarenal extract in, 474.

- Atrophic cirrhosis of liver, Talma's operation in, indications, 199; cirrhosis of liver, venous pulse in veins of forearms in, 199; lichen planus, 428; rhinitis, ichthargan in, 496.
- Atrophy, acute yellow, of liver, 198; acute yellow, of liver, aminoacids in, 623; acute yellow, of liver, free aminoacids in blood in, 198; facial, 393; in parts paralyzed from cerebral lesions, 396; infantile, 276; infantile, blood in, 260; muscular, progressive, 384; muscular, progressive spinal, in infancy, 287, 288; muscular, progressive, strychnin in, 513; red, of liver, 358.
- Atropin in summer diarrhea of children, 259; methylbromid, 485; methylbromid, effect on eye, 485; methylbromid, in asthma, 485.
- Auclair on bacterial toxins, 329; on modifications of tubercle bacillus, 295.
- Auer (J.) on influence of adrenalin on absorption, 534.
- Aural eczema, pruritus from, treatment, 442.
- Auricle, right, of heart, method of measuring pressure in, 130.
- Austin on products of glycolysis in blood upon standing, 638.
- Austin and Dawe on lobar pneumonia, 49.
- Australia, hydatid disease in, 80.
- Austria, cancer mortality in, 618.
- Autointoxication, intestinal, in children, 259; meat-, appendicitis from, 188.
- Autolysis in degenerated malignant growths, 653; of liver, effect of extracts of thyroid, kidney, and spleen on, 626.
- Autolytic ferments of liver, 626.
- Automatic wandering, 546.
- Axillary glands, enlargement of, in tuberculosis, 41.
- Axina and von Stejskal on changes in gastric secretion after extirpation of kidney, 170.
- BABCOCK on influence of high altitude on cardiac disease, 148.
- Babinski reflex, 368; in epilepsy, 416.
- Baccarini and Plessi on suprarenal extract in atony of stomach, 474.
- Bacillary dysentery in soldiers, 193.
- Bacillus, acid-proof, in pure culture, in subcutaneous abscess, 306; colon, chronic infection and subinfection by, 304; colon, on hands, 304; Czaplewski pole, in pertussis, 246, 247; diphtheria, in coryza, 243; diphtheria, in throats of sick and well, 585; diphtheria in impetigo and ecthyma, 292; diphtheria, in vaccinia, 315; diphtheria, persistence of, 243; fusiform, from tonsillar ulcer, 251; in yellow fever, 61; M, 258; of dysentery group, 305; of influenza in tonsils and larynx, 304; of pertussis, occurrence, 309; of Shiga, relation to summer diarrhea of children, 258; of tuberculosis (see also *Tubercle bacillus*); Oppler-Boas, in blood-clots, in diagnosis of gastric carcinoma, 183; Oppler-Boas, in gastric contents, 183; Oppler-Boas, in stools, in gastric hemorrhage, 184; Oppler-Boas, in urine, in gastric carcinoma, 184; pole, in pertussis, 246, 247; pseudodiphtheria, in milk, 306; pseudotubercle, in bronchiectasis, 43; pyocyanous, intracellular toxin in, 650; typhoid (see also *Typhoid bacillus*).
- Bacteria, chemistry, 650; destruction of, by boiling under low pressure, 307; excretion through kidneys, action of diuretic substances on, 354; influence of high pressure on, 307; influence on coagulation of blood, 338; staining in sections, 324; ultramicroscopic appearance, 653.
- Bacterial growth, effect of radium on, 503; toxins, 329.
- Bactericidal and growth-retarding properties of alcohols, 596.
- Bacteriologic examinations of blood, post-mortem, 303.
- Bacteriology and pathology, 295; general, 303; of ink, 619.
- Bacteriolysis of tubercle bacillus, 299.
- Bacteriolytic complement, 86; power of blood, relationship of leukocytes and organ extracts to, 327.
- Bacterium coli as cause of purpura simplex, 253; coli as indicator of fecal pollution, 607; in development of paretic dementia, 418.
- Bacteriuria in children, 280.
- Baermann and Linser on röntgen rays, 506.
- Baetjer and Gilman on effect of Röntgen rays on eggs, 543.
- Baginsky on typhoid fever in children, 238.
- Bailey, Winton, and Silvermann on adulteration of food, 609.
- Baily (W. B.) on suicide in United States, 557.
- Bainbridge on adaptation of pancreas to food, 631; on secretion, 534.
- Bakeries from hygienic standpoint, 611.
- Baldovsky on thyroid treatment of eclampsia, 515.
- Baldwin on tuberculous serums and bacteriolysis of tubercle bacillus, 299.
- Baldwin, Trudeau, and Kinghorn on tuberculin reaction, 298.
- Balfour on eosinophilia in bilharzia disease and dracontiasis, 79.
- Ball on resection of cervical sympathetic, 371.
- Ballet on x-rays, 544.
- Bamberger on collargol, 489.
- Banana and filariasis, relation, 77; flour, 608.
- Bancroft and Starling on pancreatic juice, 533.
- Bancroft, Magrath, and Brinkerhoff on leukocyte reaction in variola, 314.
- Bang's guanilic acid, 641.
- Barbadoes, spruce in, 187.
- Barbour on arsenite of copper in marasmus, 276; on calcium sulfid in whooping-cough, 486.
- Barg on muscular rigidity of spinal column, 101.
- Barium chlorid in circulatory disease, 151.
- Barjeon and Cade on pleural eosinophilia, 163.
- Barker on hereditary ataxia, 383.
- Barnard on adulteration of food, 609.
- Barnard and Morgan on phototherapy, 461.
- Barnes on thyroid gland for increasing mammary secretion, 230.
- Barr on adrenalin, 474.
- Barringer on typhoid fever, 11, 593.
- Bartenstein on Head's zones of hyperalgesia in children, 286.
- Bartholow on sodium cinnamate in locomotor ataxia, 379.
- Bartlett on mountain sickness, 528.
- Basilar meningitis, rhythmic dilation and contraction of pupil in, 390.
- Bassenge on typhoid bacillus in milk, 12.
- Bassett-Smith on abscess of liver, 200; on Mediterranean fever, 65; on spruce, 187.
- Bastian on relation between banana and filariasis, 77.
- Bathing, sea-, in skin diseases, 450.
- Bauermeister on paratyphoid fever, 27.
- Baumstark on Ehrlich's dimethylamidobenzaldehyd reaction as test for indol in feces, 185; on thiosinamin, 515.
- Bayliss and Starling on chemic regulation of secretory processes, 647.
- β -cyprinin, 644.
- Beattie on acute rheumatism and *Diplococcus rheumaticus*, 308.
- Beck on tetany in child, 287; on acute serous leptomeningitis in children, 290.
- Becquerel rays, effect on skin, 468; effect on tissues, 542.
- Beddard, Pembrey, and Spriggs on carbon dioxid in diabetes, 529; in venous blood, 637.
- Beebe on alcohol, 536; on autolysis in degenerated malignant growths, 653; on effect of alcohol on excretion of uric acid, 654; on inorganic constituents of tumors, 653.
- Beef-juice, raw, in tuberculosis in children, 250.
- Beer, action on typhoid bacilli, 592.
- Behr on collargol in tuberculosis, 488.
- Behrendt's method of quantitative estimation of sugar in urine, 81, 82.
- Behring on origin of tuberculosis, 300.
- Beilby on enuresis from masturbation, 281.
- Bence-Jones albumosuria, 207; in pleuritic effusion, 208.

- Bendie on infantile urticaria from ingestion of egg-albumin, 436.
- Bendix on influence of sweating on freezing-point of blood, 648; on pentosuria, 82; on relation between action of kidneys and action of skin, 219.
- Benedict (A. L.) on gastric proteolysis, 169.
- Benedict (F. G.) on daily curve of body-temperature, 539.
- Bennion on pneumonia, 51.
- Bergey on antistreptococcal serum, 478; on *Bacillus pseudodiphtheriae* in milk, 306.
- Beriberi, 64; and multiple neuritis, 375; metabolism in, 64; sudden death in, 64; urine in, 64.
- Berlin, dysentery in, 190.
- Berliner on differential diagnosis between syphilis and drug eruptions, 444; on mesotan eruption, 435.
- Berlioz and Jullien on mercurial caecodylate in syphilis, 453.
- Bernard on mucomembranous enterocolitis in Graves' disease, 97, 98.
- Berry and Thorne on physical development of London school boys and girls, 603.
- Bertarelli on disinfection with corrosive sublimate, 595.
- Best on boric-acid poisoning, 485; on glycogen in inflammation, 323.
- Beta rays, 502.
- Bettancourt and Franca on cerebrospinal meningitis, 593.
- Bevan (A. D.) on röntgen rays, 509.
- Bevan (R.) on pneumothorax, 164.
- Bey (A. K.) on bilharzia infection in Cairo, 78.
- Beyer, Parker, and Pothier on yellow fever, 60.
- Bial on absorption of nutrient enema, 631; on reaction for pentose, 82.
- Bickel on alcohol, 476; on examination of gastric juice, 648.
- Bieling on light as stimulant to healing of wounds, 471.
- Bienenfeld on how digestive tract protects itself from sharp bodies, 532.
- Bier on adrenalin-cocainization, 473.
- Bierring on spurious tapeworms, 257.
- Bierry and Mayer on condition analogous to alimentary glycosuria, 627.
- Bierry and Petit on cytotoxins, 627.
- Bignami and Marchiafava on disease of corpus callosum from alcoholism, 398.
- Bigot on location of cemeteries, 598.
- Bile, casein from, 628; in urine, quantitative determination, 195; thrombi, 359.
- Bile-passages, diseases of, 201; drugs as disinfectants of, 202; salicylic preparations as disinfectants of, 202.
- Bile-pigments in urine, detecting, 656; peculiarities of, in icterus, 195.
- Bilharzia anemia, 79; disease, 78; disease, Ankylostoma duodenale in, 78; disease, blood in, 78; disease, Distomum hematobium in, 78; disease, eosinophilia in, 79; disease in Cairo, 78.
- Biliary calculus, ammonia-nitrogen of urine in, 197; capillaries, normal and pathologic histology, 358; passages, carcinoma of, 360.
- Billings on confirmatory cultures in diphtheria, 587.
- Billings and Copps on acute myelogenous leukemia, 121.
- Biltz and Gatin-Gruzewska on ultramicroscope, 654.
- Bing on mercury poisoning, 565.
- Binodid of mercury in hereditary syphilis in child, 251.
- Biologic test for detecting albumin, 646; for proteids, 646.
- Birch-leaves, tea made of, for dissolving renal calculi, 222.
- Birge on treatment of morphin habit, 422.
- Birnbaum and Weber on typhoid fever, 21.
- Birth of child, dead or alive, determining, 548; premature, fetal age in, röntgen rays to assist in diagnosis, 574.
- Bismutose in diseases of intestine, 188.
- Bissell on effect of lemon-juice on typhoid-polluted water, 592.
- Bitters, 485.
- Black, hairy tongue, 440; mask of face, 439; urine, 205; vomit in children, 258.
- Black (H.) on tetanus antitoxin, 513.
- Black (H. A.) on nervous complications of typhoid fever, 22.
- Blackham (R. J.) on bradycardia, 141.
- Blackwater fever, 317.
- Bladder, atony of, adrenalin in, 474; malakoplakia of, 349; and ureter, nerves of, 539.
- Blair on recurring membranous stomatitis with erythema exudativum multiforme, 428.
- Blake and McCollom on peritonitis in scarlatina, 239.
- Blanc on freezing-point of kidneys, 324.
- Bland and Montgomery on ethyl chlorid, 492.
- Blastomycetic dermatitis, 427.
- Blastomycosis, cutaneous, röntgen rays in, 456.
- Blindness and deafness after eclampsia in child, 286; from aspidium, 483, 484.
- Bliss on borderland cases of scarlatina and diphtheria, 240.
- Bloch (C.) on gastrointestinal catarrh of children, 260; on infantile atrophy, 276.
- Bloch (E.) on blood in tumors of bone-marrow, 112; on eosinophilia in those infected with intestinal parasites, 222; on megaloocytes and megaloblasts, 337; on pernicious anemia, 116; on severe disease of blood presenting picture of acute endocarditis, 113.
- Blomquist (A.) on mercuriot, 452.
- Blondlot on N-rays, 544.
- Blood, action of adrenalin on, 336; action of toxin and antitoxin of diphtheria on, 330; agglutination test for, 627; alkalinity of, determining, Dare's instrument for, 109; alkalinity of, effect of altitude on, 627; alkalinity of, red cells and, 109; bacteriology and pathology, 333; bacteriolytic power of, relationship of leukocytes and organ extracts to, 327; changes in, produced by high altitude, 110; cholin in, detecting, 629; coagulation of, 110, 517, 628; coagulation of, in arthropods, significance of blood-corpuscles in, 338; coagulation of, influence of bacteria on, 338; coagulation of, morphology, 339; coagulation of, relation of calcium to, 518; coagulation of, relation of gelatin and calcium to, 628; diseases of, 108; diseases of, in children, 268; effect of tobacco smoke on, 569; effect of röntgen rays on, 505; examinations, 573; fatty content of, 337; free amidoacids in, in acute yellow atrophy of liver, 198; freezing-point of, effect of sweating on, 648; glycogen reaction in, 116; glycogen reaction in, in appendicitis, 116; hemoglobin in, calorimetric methods in determining amount of, 109; hemoglobin in, Hoppe-Seyler factor in determining amount of, 109; in atrophy in infants, 260; in bilharzia disease, 78; in feces, 169; gastroenteritis in children, 260; in malignant disease, 111; in nephritis, 212, 213; in paratyphoid fever, 27; in parietic dementia, 418; in rheumatism, 54; in rheumatoid arthritis, 100; in tumors of bone-marrow, 112; in variola, infectiousness of, 313; indoxyl in, 628; infectiousness of, in variola, 313; influence of female castration on, 537; lacking of, by ether, 520; leukemic, peptic and tryptic ferments in, 628; methods of examination, 108; of children, iodine reaction in, 271; of newborn, 522; osmotic pressure of, 110; osmotic pressure of, increase in, as indication of insufficiency of kidneys, 111; pathology and bacteriology, 333; periodic losses of, pathologic effects, 335; physiology, 517; plasma, volume of, 519; postmortem bacteriologic examinations of, 303; precipitation method for determining, 573; quantity of, in lesser circulation, 527; reaction of, 522; serum test for, 627; severe disease of, presenting picture of acute endocarditis, 113; test for, 626; venous, quantity and pressure of carbon dioxide in, 637; viscosity of, 519, 628; in asphyxia, 519; influence of sweating

- on, 519; influence of temperature on, 519.
- Blood-cells, necrobiotic, morphologic and tinctorial changes in, 339.
- Blood-clots in bronchi, 165; Oppler-Boas bacilli in, in diagnosis of gastric carcinoma, 183.
- Blood-conditions in Banti's disease, 125.
- Blood-corpuses, influence of adrenalin on, 521; influence of albumose on, 521; influence of serum-albumin and serum-globulin on, 522; influence of suprarenin on, 521; influence of various substances on, 521; method of counting, 108; number of, in children, 268; osmotic pressure, 520; significance of, in coagulation of blood in several arthropods, 338; volume index, 520; volume of, 519.
- Blood-cultures in pneumonia, 52.
- Blood-letting in hemorrhagic disease of newborn, 253.
- Blood-plaques, staining of, 109.
- Blood-plasma, proteids of, 627.
- Blood-platelets, origin, 335.
- Blood-pressure, 151; at time of perforative peritonitis in typhoid fever, 19; effect of body-work on, 152; in arteriosclerosis, 152, 154; in disease of heart, 154; in tuberculosis, 37; in typhoid fever, 15, 153.
- Blood-serum, 574; after nephrectomy, 521; agglutinates fat, 632; albumin in, refractometric determinations of, 110; hemolytic action, 328; hemolytic activity, in uremia, 217; osmotic pressure, 520.
- Blood-stains, immunized antiserum for identifying, 573.
- Bloodvessels and heart in typhoid fever, 153; diseases of, in children, 266; retinal, 528; rupture of, as accidental injury, 549.
- Bloody vomit in children, 258.
- Blue light treatment of skin diseases, 463.
- Blum (R.) on cinnamic acid in tuberculosis, 487.
- Blum (S.) on streptococcus in summer diarrhea, 259.
- Blumenthal on glycolytic ferment, 85.
- Blumenthal and Wolff on excretion of glyceronic acid in fever, 81.
- Blumer on status lymphaticus, 273.
- Boas on calcium chlorid in bleeding piles, 486; on gastric ulcer, 174.
- Bodon (K.) on morphologic and tinctorial changes in necrobiotic blood-cells, 339.
- Body-temperature, daily curve, 539.
- Body-weight of infant, water and salts and, relation, 233.
- Body-work, effect on blood-pressure, 152.
- Boelke on morphologic changes in erythrocytes, 333.
- Boggs on röntgen-ray therapy, 510.
- Boidin and Chauffard on meningitis in parotitis, 290.
- Boil, Aleppo, protozoa in, 427.
- Boiling under low pressure, destruction of bacteria by, 307.
- Boinet on adrenalin in Addison's disease, 475; on suprarenal therapy in Addison's disease, 99.
- Bolton on disturbances of compensation of heart in relation with dropsy, 134; on typhoid fever, 22.
- Bondi on Ehrlich's diazo-reaction, 203, 655.
- Bondurant on hook-worm, 225.
- Bone, sensibility of, tuning-fork in determining, 364.
- Bone-marrow, glycerinated, in rachitis, 279; of rabbits, action of lead, mercury, phosphorus, iron, and quinin on, 336; reactions from, in myelopathic albumosuria, 208; tumors of, blood in, 112.
- Bone-tenderness in lymphatic leukemia, 119.
- Bonic on night-sweats in phthisis, 37.
- Bonis and Brindley on carbolic acid in variola, 486.
- Bönninger on gastric juice, 533; on Sahli's method of determining function of stomach, 168.
- Booker on Bacillus M, 258.
- Boot on blindness and deafness after eclampsia in child, 286.
- Borated food, effect on kidneys, 640.
- Borax, 485; as food preservative, 611; metabolism after administration, 640.
- Borchardt on sugar-formation in liver, 536.
- Bordas on arsenic, 624.
- Bordet and Gengou on blood coagulation, 628.
- Boric acid, 485; as preservative, 611; poisoning from, 485.
- Borisoff (P.) on effect of bitters, 485.
- Borland on acute eczema pustulosum in infant, 292.
- Borri on aspirin, 484.
- Botcheroff on veronal, 515.
- Bothriocephalus, 228; substance, injection of, in production of a precipitin, 228.
- Boulud and Lepine on röntgen rays, 505, 646.
- Bouma on quantitative determination of bile in urine, 195.
- Bourcart on diphtheria bacillus, 243.
- Bourneville and Lemaire on rachitic feeble-mindedness, 278, 279.
- Boutin on anorexia in diphtheria, 243.
- Bouveyron on uranium nitrate in lupus, 503.
- Bovaird on pathology of lobar and bronchopneumonia, 264; on pneumothorax in children, 265.
- Bovine and human tuberculosis in children, relation, 247, 248; and human tuberculosis, intercommunicability, 33; and human tuberculosis, relation, 582; tuberculosis and tuberculosis of udder, 249; tuberculosis, diagnosis of, comparisons of tuberculins of human and bovine tubercle bacilli in, 300.
- Bowen (J. T.) on acute infectious pemphigus during epizootic of foot-and-mouth disease, 430.
- Bowen (W. T.) on exercise and pulse-rate, 524.
- Bowie (J. C.) on antiseptics in tuberculosis, 45.
- Bowker on Koch's lymph in lupus, 431.
- Boycott on leukocyte-counts in parasitic infections, 223.
- Bradford on distinction between Bright's disease and simple nephritis, 213.
- Bradley on quinin in Ménière's disease, 501.
- Bradycardia, frequency in normal persons, 141; in diphtheria, 243; with Adame-Stokes syndrome, 142.
- Braillon and Jousset on diagnosis of tuberculous endocarditis, 39.
- Brain and spinal cord, chemie analysis, 628; chiasm of, tumors of, 397; diseases of, 395; endothelioma of, in child, 291; hydatid cyst of, in child, 291; nerve-cells of, in chorea, 399, 400; tumor of, 396; tumor of, hemiplegia of gradual onset in diagnosis of, 397; tumor of, relief of pain in, 396.
- Bramwell (B.) on infantilism due to defective pancreatic secretion, 276.
- Bramwell (J. M.) on hypnotism, 375.
- Branchiogenic organs, cysts and glandular vesicles of, 343.
- Brandenburg on digitalis, 490; on slowing of pulse in icterus, 197.
- Brandt on röntgen rays in cancer, 456.
- Brasch on cinnamic acid in tuberculosis, 487.
- Braun on value of combining adrenalin with cocaine, 472.
- Braunstein on glycolysis, 85; on urobilin in gastric contents, 196.
- Bread, acid contents, 608; made from finer grades of flour, 631.
- Breakfast foods, analysis, 609.
- Breast, carcinoma of, röntgen rays in, 506; tuberculosis of, 297.
- Breast-milk in acute enterocolitis in children, 280; in acute inflammations of digestive tract in children, 260.
- Brecelj on pseudodiphtheritic lesions of soft palate in newborn, 256.
- Breton on biniodid of mercury in hereditary syphilis, 251.
- Brethau on dispensaries for consumptives, 581.
- Breuer and Seiller on chlorosis, 116; influence of female castration on blood, 537.
- Briggs on blood-pressure at time of perforative peritonitis in typhoid fever, 19.
- Bright's disease (see also *Nephritis, acute*).

- Brindley and Bonis on carbolic acid in variola, 486.
 Brink on lactogol, 498.
 Brinkerhoff on infectiousness of skin-lesions in variola, 314.
 Brinkerhoff and Magrath on *Cytoryctes variolæ*, in skin of monkey inoculated with variola-virus, 312; on experimental variola in monkey, 310; on infectiousness of blood in variola, 313.
 Brinkerhoff, Councilman, and Magrath on variola, 309.
 Brinkerhoff, Magrath, and Bancroft on leukocyte reaction in variola, 314.
 Bristow on suicides from carbolic acid, 556.
 British army, prevalence of venereal and other diseases in, 615.
 Broadbent on albuminuria, 211; on congenital heart lesion in child, 266.
 Brocq on röntgen rays in mycosis fungoides, 508; on treatment of pruritus, 441.
 Brodie and Dixon on vasomotors of lungs, 526.
 Bromin as disinfectant, 594.
 Bromocoll in lichen urticatus and eczema in children, 292.
 Bromoform poisoning in child, 294.
 Bronchi, blood-clots in, 165.
 Bronchial glands, enlargement of, in children, 262.
 Bronchiectasis, 162; congenital, 162; hemorrhages from, in diagnosis of tuberculosis, 40; in children, 262; in children following measles, 263; in tuberculosis, 38; pseudo-tubercle bacilli in, 43; röntgen rays in, 162.
 Bronchopneumonia complicated by meningeal symptoms, modifications in cerebrospinal fluid in, 290; in children, 263; in children, pathology, 264; in pertussis, open-air treatment, 246.
 Bronson on carbolic acid in pruritus, 442.
 Bronzed diabetes, 88.
 Brosech on anatomy and pathogenesis of diverticulums in anterior wall of esophagus, 356; on natural disposition of esophagus to formation of diverticulums, 356.
 Brouardel on trauma of tongue, 575.
 Brown on theatrical profession in dissemination of disease, 601.
 Brown (E. J.) on röntgen rays in anemia, 114.
 Brown (H. C.) on Klebs-Löffler bacilli in vaccination, 315.
 Brown (L.) on tuberculosis, 43.
 Brown (O. H.) on effect of salts on urinary secretion, 539.
 Brown (S.) on progressive muscular atrophy, 384; on strychnin in progressive muscular atrophy, 513.
 Browning (W.) on apoplectic conditions, 396; on relief of pain in tumors of brain, 396.
 Bruce and Peebles on katatonic form of adolescent insanity, 419.
 Bruce, Lund, and Whitecombe on myelopathic albumosuria, 208.
 Bruce, Nabarro, and Greig on trypanosome theory of sleeping-sickness, 73.
 Bruck on typhoid infection through butter, 13, 392.
 Bruit de tabourka, 156.
 Bruner on venesection in heart-disease, 149.
 Bruns on hysteria in children, 286.
 Bryant on carbon tetrachlorid for extraction of fat, 633.
 Bryant and Crane on splenomedullary leukemia, 123.
 Bubonic plague, 61 (see also *Plague*).
 Buchanan (J.) on hyoscin in morphinism, 495.
 Buchanan (W. J.) on aspects of medical jurisprudence in India, 554.
 Bulbar paralysis in child, 291.
 Bulkley on radium in lupus vulgaris, 468.
 Bulloch and MacLeod on chemistry of tubercle bacillus, 651.
 Bullot on different degree of avidity for oxygen in corneal epithelium, 529.
 Bullowa and Kaplan on adrenalin in asthma, 161, 474.
 Bunge on ash of milk and other food-stuffs, 640.
 Burial, earth-, sanitary aspects, 598.
 Burke on N-rays, 647.
 Bürker on coagulation of blood, 517.
 Burlew (J. M.) on typhoid fever, 22.
 Burley on facial atrophy, 393.
 Burnet on acute chorea in children, 255; on ichthargan in atrophic rhinitis, 496; on ichthyol in tuberculosis, 44.
 Burns (F. S.) on röntgen rays, 457, 508.
 Burns (W. B.) on malarial form of dysentery, 193.
 Burr and Pfahler on thrombosis of middle-bellar artery, 398.
 Burrows and Sutherland on diagnosis of intussusception for Henoch's purpura, 253.
 Burton-Opits on viscosity of blood, 519, 628.
 Bury on respiration in hemiplegia, 395.
 Busch on grafting of suprarenal tissue, 538.
 Busse on chorioepithelioma outside placental site, 321; on cystic kidney and disturbances in development, 353.
 Butter, canned, fat-splitting ferments as cause of changes in, 633; typhoid fever from, 13, 592.
 Buttermilk in infant-feeding, 236.
 Buttersack on urotropin in scarlatina, 515.
 Byers and Hamilton on diastolic aortic murmur, 146.
 Byles and Ricketts on red light in variola, 505.
 Bythell on bacteriology of empyema in children, 305.
 CABANNES on ophthalmoplegia in child, 291.
 Cabot on physiologic action of alcohol, 475; on strychnin in febrile diseases, 513.
 Caccia (G.) on suppurative thyroiditis, 246.
 Cachexia strumipriva, thyroid preparations in, 98.
 Cactus grandiflorus, 485; in cardiac pain, 486.
 Cade and Barjeon on pleural eosinophilia, 163.
 Cadmium iodid in acne rosacea, 451.
 Caffein in destroying appetite for alcohol, 573.
 Cagnetto (G.) on tumor of hypophysis, 344.
 Cagnetto and Tessaro on action of diuretic substances on excretion of bacteria through kidneys, 354.
 Caie on antistreptococcus serum in puerperal sepsis, 479.
 Caiger on diphtheria, 242.
 Caillé on diphtheria antitoxin, 244, 480.
 Cairo, bilharzia disease in, 78.
 Cairus on Yersin's antiplague serum, 477.
 Caisson disease, 529, 602.
 Calcar on diphtheria toxin, 650.
 Calcium and gelatin, relation to blood coagulation, 628; chlorid, 486; chlorid, effect on hemolysis, 521; chlorid in bleeding hemorrhoids, 486; relation to coagulation of blood, 518; sulfid, 486; sulfid in whooping-cough, 486.
 Calculus, biliary, ammonia-nitrogen of urine in, 197; renal, 218; renal, treatment, 221.
 Caldwell and Pusey on röntgen rays in tuberculous adenitis, 508.
 Calkins on life-history of *Cytoryctes variolæ*, 311.
 Calmette treatment of wounds, 513.
 Calorimetric methods in determining amount of hemoglobin in blood, 109.
 Calvert on intestinal parasites, 222; on syphilitic icterus, 198.
 Calves' spleen in treatment of splenic anemia in children, 271.
 Calvo on proteids in urine, 208, 654.
 Calvo and Albu on proteids absent from feces, 631.
 Calvo and Zweig on Sahli's test-meal, 168.
 Cambier's method of isolating typhoid bacilli, 25.
 Camerer (J.) on collargol, 488.
 Cameron (J.) on skiagraphy to assist in diagnosis of fetal age, 574.
 Cammidge on chemistry of urine in diseases of pancreas, 203.
 Campanella on atropin methylbromid in asthma, 485.

- Campbell on intratracheal injections in asthma, 161.
 Camphor, oil of, in tuberculosis, 44.
 Camus and Gaudier on lymphangioma of tongue, 255.
 Cancerous stricture of esophagus, radium in, 504.
 Cane-sugar, inversion in stomach, 631.
 Cannon on nature and consistence of food as influencing length of sojourn in stomach, 531.
 Cantharidin, action on kidney and spleen, 351.
 Cantile on minced meat in sprue, 187, 188; on plague, 61; on typhoid fever in China, 17.
 Capillaries, biliary, normal and pathologic histology, 358.
 Capillary walls, damage of, as cause of dropsy, 134.
 Capps on volume index of blood corpuscles, 334.
 Capps and Billings on acute myelogenic leukemia, 121.
 Carbohydrates, influence on decomposition of albumin, 177, 178; influence on gastric secretion, 177.
 Carbolic acid, 486; gangrene from, 486; in plague, 486; in pruritus, 442; in variola, 57, 486; suicide from, 556.
 Carbolic-acid poisoning, alcohol as antidote in, 476.
 Carbon dioxid in diabetes, 529; dioxid, quantity and pressure, in venous blood, 637; monoxid poisoning, 568; tetrachlorid for extraction of fat, 633.
 Carbonic acid gas, poisoning from, 568.
 Carcinoma, actinotherapy in, 460; concentrated sun's rays in, 462; gastric, 180 (see also *Gastric carcinoma*); inoperable, radium in, 503; metabolism in, 653; mortality from, in Austria, 618; of biliary passages, 360; of breast, Röntgen rays in, 506; of esophagus, pathology, 168; of hepatic cells, 360; of intestine, 194; of liver, 360; of pancreas, histogenesis, 361; of stomach, 180, 358 (see also *Gastric carcinoma*); papillary, of renal pelvis, 354; parasitic origin, 318; radium bromid in, 504; radium in, 504; röntgen rays in, 456, 507, 509; transmissibility, 318.
 Carcinoma-cells, network in, 318.
 Cardia, muscular closure, 171.
 Cardiac dropsy in children, theocin in, 293, 294; lesion in arthritis deformans, 103; symptoms in Graves' disease, 96, 402; toxemia of pneumonia, treatment, 53.
 Cardiopneumonia, 146.
 Cardiopulmonary murmur, nature and causation, 132.
 Cardiosplanchnic phenomenon, 170.
 Cardiovascular system, diseases of, 128; system, methods of examination, 128.
 Carditis in children, opium in, 267.
 Carlot on emulsion-albuminuria, 655.
 Carle on Finsen light in lupus, 471.
 Carlson on heart-beat, 523; on heart-nerves, 525.
 Carpenter (D. N.) on epidemic of catarrh, 160.
 Carpenter (G.) on congenital cysts of lung in children, 266; on congenital syphilis producing nephritis in children, 283; on syphilis and rickets in splenomegaly in early life, 270; on tuberculosis, 248.
 Carrara on relation of calcium to coagulation of blood, 518.
 Carrier on röntgen ray in mycosis fungoides, 432.
 Carrière on tubercular cirrhosis in child, 250.
 Carroll on transmission of yellow fever, 60.
 Carter on *Stegomyia fasciata* in America, 60.
 Casein from bile, 628; physiologic chemistry, 628.
 Caseoserum and lactoserum, human and cow's precipitin reaction, 641.
 Caskie on venesection in opium poisoning, 571.
 Castaigne and Rathery on action exercised in vitro by solutions of sodium chlorid on renal epithelium, 351; on injurious action exercised in vitro on renal epithelium by serums, 351.
 Castellani on trypanosome in sleeping-sickness, 73.
 Castor oil in typhoid fever, 26.
 Castration, female, influence on blood, 537.
 Casts, absence of, in nephritis, cause, 215; in urine, electricity in removal of, 221.
 Catabolism, proteid, 627.
 Catarrh, epidemic, 160; gastrointestinal, of children, 260; diphtheria, 241.
 Catarrhal icterus, epidemic, 198.
 Cathelin on epidural injections in enuresis, 370.
 Cautley on condensed milk as cause of tuberculosis, 248; on hypertrophic stenosis of pylorus, 256.
 Cavazzani (E.) on sugar-formation in liver, 536.
 Cavazzani (G.) on garlic in tuberculosis, 44.
 Cell-proteids, fat formed from, 632.
 Cells, blood-, necrobiotic, morphologic and tinctorial changes in, 339; cancer-, network in, 318; giant-, histogenesis, 322; hepatic, adenoma of, 360; hepatic, carcinoma of, 360; liver-, toxin from, 650; mast-, hematogenous origin, 115; nerve-, of brain, in chorea, 399, 400; plasma, origin of, 322; polymorphonuclear, in diarrhea of children, 260.
 Cemeteries, location, 598.
 Ceni on *Aspergillus fumigatus*, 306.
 Cereal foods, 608.
 Cerebellar tumor in child, lumbar puncture in, 291.
 Cerebral circulation, 528; circulation, effect of essences on, 528; cortex, physiology, 540; lesions, atrophy in parts paralyzed from, 396; meninges, diseases of, 384; syphilis, diffuse, general paralysis and, anatomic differentiation, 419.
 Cerebrospinal fluid, aspiration of, in tetanus, 401; fluid, modifications in, in pneumonia and bronchopneumonia complicated by meningeal symptoms, 290; meningitis, 57, 393; crane-like appearance in, 58; epidemic, in children, 288, 289; injection of lysol into spinal canal in, 289; lysol in, 393; purulent arthritis in, 57; specific cause, 593; treatment, 393.
 Cervical sympathetic, resection of, 371.
 Ceylon, malaria in, prophylaxis, 69.
 Chaffey on endothelioma of brain in child, 291.
 Chajes on alimentary glycosuria, 655.
 Chajes and Strauss on refractometric determinations of albumin in body-fluids, 110.
 Chaldecott and Stephenson on ethyl chlorid, 492.
 Chamberlain and Hawk on rate of excretion of nitrogen, sulfate, and phosphate, 632.
 Chancres, syphilitic, multiplicity, 445.
 Chapin on nutritive requirements of infants, 233.
 Charlton on chronic infection and subinfection by colon bacillus, 304.
 Charpentier on rays from muscles and nerves, 543, 544.
 Charter, medicolegal aspects, 552.
 Charteris and Stockmann on action of lead, mercury, phosphorus, iron, and quinon on bone-marrow of rabbits, 336.
 Chase (H. L.) on mosquito nuisance in Brookline, 70.
 Chauffard and Boidin on meningitis in parotitis, 290.
 Chauveau on temperature, 540.
 Cheever on privileged communications, 577.
 Chemic composition of body after disorders of nutrition in children, 279.
 Chenu and Morel on iodine in parathyroids, 638.
 Cherepin on aphasia in scarlatina, 240.
 Chest, tuberculous disease of, 38.
 Chiantante on alimentary glycosuria, 655.
 Chiasm of brain, tumors of, 397.
 Chimpanzee, typhoid fever in, 13.
 China, typhoid fever in, 17.
 Chittenden on minimum proteid requirements, 639.
 Chizunoff on acute ascending polyneuritis in children, 287.
 Chlopin on anilin dyes, 611.

- Chlopin and Tammann on influence of high pressure on microorganisms, 307.
 Chlorid retention in pneumonia, 656.
 Chloroform, 487; fatal effects on children with fatty liver, 257.
 Chlorosis, 116; anomalies in genital apparatus as cause, 116; metabolism in, 340.
 Cholecystitis in typhoid fever, 22.
 Cholelithiasis, colic in, 202; in glycosuria 83; in typhoid fever, 22.
 Cholemia, 337.
 Cholera, 62; agglutination in diagnosis of, 63; bacteriologic diagnosis, 62; soil as transmitter, 591; vaccination against, 332, 477; vaccine, method of producing, 63.
 Cholera-like vibrios in human stools, 62.
 Cholin in blood, detecting, 629; in epilepsy, 414; physiologic chemistry, 628.
 Chorda tendinea, anomalies of, 348.
 Chorea, 399; acute, in children, *Tania solium* as cause, 255; aspirin in, 484; collargol in, 488; in children, cardiac disease in, 255; in children, pathology and treatment, 254; in children, salicylates in, 254; in children, salicylate of soda in, 255; infectious, in children, arsenic in, 255; major, 254; minor, in children, pneumonia in, 254; nerve-cells of brain in, 399, 400; of heart, 399; pseudo-, 254; sodium salicylate in, 511; syphilis as cause, 399.
 Chorioepithelioma outside placental site, 321.
 Chowry-Muthu on formaldehyd in tuberculosis, 45.
 Christy on mode of entry of spore into red corpuscle in malaria, 68; on sleeping-sickness, 72; on tick fever, 78.
 Christy, Dutton, and Todd on trypanosomiasis, 75.
 Chromatin system, destruction of, in Addison's disease, 99.
 Chrysopathes on röntgen rays in sarcoma, 506, 507.
 Chyluria, *Eustrongylus gigas* as cause, 80.
 Cicatricial stenosis of pylorus, thiosinamin in, 515.
 Cider vinegar, standard of, 609.
 Cinnamic acid, 487; in tuberculosis, 487.
 Circulation, 522; action of adrenalin and peptone on, 526; cerebral, 528; cerebral, effect of essences on, 528; changes in, cyclic albuminuria and its relation to, 210; disturbance of, as cause of insomnia, 133; disturbances of, gymnastic exercises in, 149; disturbances of, in acute infectious diseases, 135; lesser, quantity of blood in, 527.
 Circulatory diseases, barium chlorid in, 151; system, bacteriology and pathology, 345.
 Cirrhosis of liver, 199; of liver, atrophic, Talma's operation in, indications, 199; of liver, atrophic, venous pulse in veins of forearms in, 199; of liver, in children, 257; of liver, reaction to ferric chlorid in, 199; tubercular, in child, 250.
 Cladius on preservation of anatomic preparations, 323.
 Claiborne and Coburn on collargol, 489.
 Clark (L. P.) on movements of superior intercostal muscles in hemiplegics, 395.
 Clark (W. B.) on sprue in Barbadoes, 187.
 Clark and Prout on status epilepticus, 415.
 Clark and Taylor on facial palsy, 394.
 Clarke (C. K.) on criminals, 558.
 Clarke (F. M.) on veronal poisoning, 567.
 Clarke (G.) on veronal poisoning, 516.
 Clay pastes in eczema, 450.
 Clayton and Butterfield on action of thymol in uncinariasis, 225.
 Cleaves on radium in cancer, 504.
 Clemens on acute urticaria in child, 237; on rheumatism in children, 253; on enlargement of bronchial glands, 262.
 Club-fingers, 104.
 Clysters, influence on peristalsis, 178.
 Coagulation of blood, 110, 517, 628; in arthropods, significance of blood-corpuscles in, 338; influence of bacteria on, 338; morphology, 339; relation of calcium to, 518; relation of gelatin and calcium to, 628.
 Coblenz on hedonal, 495.
 Coburn on associated movements of upper eyelid and lower jaw, 374.
 Coburn and Claiborne on collargol, 489.
 Cocain, 487.
 Cocain and adrenalin, value of combining, 472; hydrochlorate and adrenalin in hemorrhoids, 474.
 Cocainization, spinal subarachnoid, 487.
 Coccobacillus *hæmophilus*, 305.
 Coccyx, fracture of, and sprained ankle, damages for, 555.
 Cod-liver oil in rachitis, 278.
 Cohen (M. S.) on xiphosternal crunching sound, 133.
 Cohen (S. S.) on aspirin, 484; on cactus *grandiflorus* in cardiac pain, 485, 486; on judicial determination of cause of death, 548; on theocin, 514.
 Cohn (M.) on coxa vara from rickets, 278.
 Cohnheim (O.) on decomposition of sugar by combination of muscle and pancreatic substance, 84.
 Cohnheim (P.) on bismutose in diseases of intestine, 188; on olive oil in pyloric stenosis, 500.
 Cold, local, influence of, on cardiac action, 149.
 Cole (R. I.) on prevention of typhoid fever, 25.
 Cole (S. W.) on action of salts on digestive power of ptyalin, 532.
 Coleman (W.) on collargol in erysipelas, 488; on urotropin poisoning, 570.
 Coleman (W. S.) on automatic wandering, 546.
 Coley on röntgen rays in sarcoma and carcinoma, 507.
 Colic in gallstone disease, 202.
 Colitis, acute, from milk-poisoning, 186.
 Collargol, 487; in chorea, 488; in endocarditis, 488; in erysipelas, 488; in infected wounds of eye, 489; in puerperal sepsis, 488; in tuberculosis, 488.
 Collier on gastric ulcer, 180.
 Collins on chronic cyanosis with polycythemia and splenomegaly, 126.
 Collins and Zabriskie on arteriosclerosis of spinal cord, 381.
 Collins, Park, and Goodwin on dysentery bacillus growth, 305.
 Colloids, action of radium on, 646.
 Colman on infantile scurvy, 279.
 Colon bacillus, chronic infection and subinfection by, 304; bacillus on hands, 304; giant-, in children, 274.
 Colquhoun and McKendrick on N-rays, 647.
 Coma, diabetes terminating in, 88.
 Combe on intestinal autointoxication, 259.
 Comby on lichen serofulosorum in children, 293; on osteitis in children, 275; on relapses in measles, 245.
 Communications, privileged, 577; French attitude toward, 576.
 Complement, bacteriolytic, 86.
 Concetti on ferments in milk, 231.
 Condensed milk as cause of tuberculosis in children, 248; quality, 612.
 Congested liver, chronically, 358.
 Conjunctivitis in dysentery, 191.
 Connell on aspirator, 164.
 Conner and Dodge on physical signs in pneumonia, 50.
 Consciousness, double, 546.
 Constipation, chronic habitual, absorption in, 188; exodin in, 188.
 Constitutional derangement, gallstones from, 202; diseases in children, 271.
 Continued fever, 23.
 Contracture, Dupuytren's, in diabetes, 87.
 Convelaire on congenital cystic degeneration of lung, 266.
 Cooke on molluscum fibrosum of skin associated with similar condition of rectum, 433.
 Cooking of shellfish, 611.
 Coon on röntgen rays, 509.
 Cooper on green urine, 206.
 Cooper and Hall on typhoid fever, 16.
 Copper, arsenite of, in marasmus, 276; in syphilis, 448; poisoning, 566.
 Cordite, 568.

- Corester (E.) on diagnosis in tabes, 380.
 Coriat on Bence-Jones protein in pleuritic effusion, 208; on emulsion-albuminuria, 212.
 Corpus callosum, disease of, from alcoholism, 398; luteum, physiology, 537.
 Corpuscles, blood-, influence of adrenalin on, 521; influence of albumose on, 521; influence of serum-albumin and serum-globulin on, 522; influence of suprarenin on, 521; influence of various substances on, 521; method of counting, 108; number of, in children, 268; osmotic pressure, 520; significance of, in coagulation of blood in several arthropods, 338; volume index, 519, 520.
 Corrosive sublimate, disinfection with, dangers, 595; poisoning, 566.
 Cortex, cerebral, physiology, 540; granati in tropical dysentery, 193.
 Cortical areas, 540.
 Coryza, diphtheria bacilli in, 243.
 Cough, nasopharyngeal condition in, 247.
 Cruncilman, Magrath, and Brinkerhoff on variola, 309.
 Courmont and Arloing on agglutination of tubercle bacilli, 296.
 Coutts on purulent pericarditis in child, 267.
 Coville on typhoid fever, 16.
 Cowan on fibrosis of heart, 348.
 Cowan and Ferguson on congenital heart-disease, 267.
 Cow's udder for increasing mammary secretion, 230.
 Coxa vara from rickets, 278.
 Craig (A. B.) on ethyl chlorid, 492.
 Craig (C. F.) on life-cycle of *Amoeba coli*, 191.
 Cramer and Vincent on nervous tissue extracts, 539.
 Cramp in muscles in amebic dysentery, 19.
 Crane and Bryant on splenomedullary leukemia, 123.
 Crane-like appearance in cerebrospinal meningitis, 58.
 Cranial nerve, fifth, sensory distribution, 386; nerve, seventh, paralysis of, sign of orbicularis in, 394; nerves, diseases of, 384.
 Craniotabes, 277.
 Creasote carbonate, 489; in croupous pneumonia, 489.
 Creatinin, physiologic chemistry, 629; rapid and accurate method for determination of, 629.
 Credé's silver in sepsis, 59.
 Creolin, 489.
 Crepitation, laryngeal, in phthisis, 141.
 Cretinism in calves, 344; sporadic, 98; sporadic, thyroid preparations in, 98.
 Crichton-Browne on infant mortality, 618.
 Crile on action of alcohol on shock, 476; on cause of vascular shock, 527; on digitalis, 491; on effect of strychnin in shock, 513; on nitroglycerin and amyl nitrite, 499.
 Crime, 556; alcoholism as cause, 558; insanity in, 560; responsibility and, 558.
 Criminal proceedings, allowances to prosecutors and witnesses in, 577; reform upon, 558.
 Crisafulli on enlargement of thyroid in epilepsy, 416.
 Crises, gastric, in tabes dorsalis, 171; of fever in tabes dorsalis, 377.
 Cristiani on heterothyroid grafting, 538.
 Croftan on interaction of ferments in destruction of sugar, 637.
 Croizet on poisoning from carbon monoxid, illuminating gas, and carbonic acid gas, 568.
 Crombie on gout in tropics, 95.
 Croner on diabetes mellitus, 87.
 Crotalus antivenin, 651.
 Crothers on opium in infancy as cause of neurotic diatheses of adults, 285.
 Croton oil, poisoning from, 568.
 Croup, pharyngeal, dyspnea in, treatment, 261.
 Croupous pneumonia, creasote carbonate in, 489; formation of sequestrum in, 264.
 Crouzon and Loeper on action of adrenalin on blood, 336; on edema in hemiplegia, 396.
 Cruveilhier on diphtheria antitoxin, 480.
 Cryoscopy in scarlatina and diphtheria, 240; of animal organs, 324.
 Cryptogenic acid-intoxication, 108.
 Cultures, confirmatory, in diphtheria, 587.
 Cumliffe on blood in malignant disease, 111.
 Cumston on malpractice, 564.
 Curlo on physostigmin salicylate, 500.
 Currents, high-frequency, in treatment of skin diseases, 463.
 Currie on beriberi, 64.
 Curschmann on typhoid fever, 14.
 Curschmann's spirals, nature of, 161.
 Curtin on bradycardia and Adams-Stokes syndrome, 143.
 Cushing (E. F.) on stomatitis in impetigo contagiosa in children, 292.
 Cushing (H.) on sensory distribution of fifth cranial nerve, 386; on surgical tumor of meninges, 380.
 Cushny on secretion of acid by kidney, 539.
 Cutaneous anesthesia, postoperative, field of, diagram showing, 386; diseases, 425 (see also *Skin diseases*); syphilis ex juvantibus, diagnosis, 444.
 Cuziner on appendicitis, 188.
 Cyanosis, acetanilid, differentiation from chronic cyanosis with polycythemia and enlarged spleen, 127; chronic, with polycythemia, 125; chronic, with polycythemia and enlarged spleen, 125, 126, 127; chronic, with polycythemia and enlarged spleen, differentiation from acetanilid cyanosis, 127; chronic, with polycythemia, symptoms, 126.
 Cyclaster scarlatinialis of Mallory in scarlet fever, 315.
 Cyclic albuminuria, 211; albuminuria in children, 281, 282; albuminuria in children, movable kidney in, 282; albuminuria, proteins in urine of children with, 654; albuminuria, relation to changes in circulation, 210; vomiting in children, 272.
 Cypress oil in pertussis, 246.
 Cystic kidney, 353.
 Cystin, feeding of, effect, 630; physiologic chemistry, 629.
 Cystitis, gonorrheal, ichthargan in, 496; helmitol in, 495; in young girls, 280.
 Cysts, congenital, of lung, in children, 266; hydatid, of brain, in child, 291; of branchiogenic organs, 34.
 Cytodiagnosis in pleural and peritoneal effusions, 42; in tuberculous pleurisy, 42.
 Cytolysins, 325.
 Cytoryctes variolæ, 311, 312; in skin of monkey inoculated with variola-virus, 312; life-history, 311.
 Cytotoxins, 627; somatogenic, specificity, 326.
 Czaplewski's pole-bacteria in pertussis, 246, 247.
 Czerny and Stoklassa on formation of alcohol by animal tissues, 637.
 D'HALLUIN on deciding whether infant has been born dead or alive, 547, 548.
 D'Orlandi on calves' spleen in treatment of splenic anemia, 271.
 D'Ormea on effect of essences on cerebral circulation, 528.
 DaCosta on surgery of idiocy and insanity, 422.
 Dabney on quinin in malaria, 70.
 Daddi on pathologic conditions in ganglions and nerves of heart, 147.
 Dagonet on transmissibility of cancer, 318.
 Dakin and Kossel on arginase, 622, 624; on hydrolytic products of salmin, 644; on protamins, 644.
 Daland on leprosy in Hawaiian Islands, 66.
 Dana and Hunt on tuberculosis of spinal cord, 382.
 Dansey on ethyl chlorid, 492.
 Danyasz on radium rays, 502, 543.
 Dapper and Mohr on metabolism in nephritis, 219.
 Darcagne on insane monolog, 421.
 Dare's instrument for determining alkalinity of blood, 109.
 Darier (M.) on effect of adrenalin on eye, 473.

- Darier (M. A.) on radium in nervous diseases, 504.
 Darier-Hutchinson molar, 445.
 Davidson (C. F.) on typhoid fever, 13.
 Davidson (J.) on scurvy, 127.
 Davidson (J. M.) on radium, 465, 504.
 Davies (A.) on sources of infection in tuberculosis, 302.
 Dawe and Austin on lobar pneumonia, 49.
 De Benedetti on *Bacterium coli* as cause of purpura simplex, 253.
 De Castle on lactic acid in pruritus in children, 442.
 De Haan on angiosarcoma of liver in child, 321; on experimental tuberculosis, 297.
 De Jong on lienal leukemia, 122; on splenic leukemia, 342.
 De Josselin de Jong on papillary cancer of renal pelvis, 354.
 De la Camp on acute dilation of heart, 143; on determining size of heart, 130.
 De la Touche and Dide on chronic thyroiditis, 342.
 De Piasetzak on polyvalence of antistreptococcal serum, 329.
 De Simon on formaldehyd in whooping-cough, 493.
 De Stoutz and Leiter on transmission of diphtheria by water, 585.
 Dead body, medicolegal aspects, 547.
 Deafness and blindness after eclampsia in child, 286.
 Death, apparent, by drowning, resuscitation in, 530; by drowning, 530; cause of, judicial determination, 548; from eating unsound oysters, medicolegal aspects, 550; from strangulation, anatomic conditions in, 547; from suffocation, 547; medicolegal aspects, 547; of infants from overlying in England, 559; somatic, possibility of restoration of mammalian heart after, 523; somatic, survival of cardiac nervous mechanism after, 525; unusual form, in child, 547.
 Death-rate from other diseases than smallpox, effect of vaccination on, 591.
 Deaths in England, registration, 613.
 Dee Narchis and Jaja on silver fluorid in smallpox, 451.
 Deglutition, physiology, 530.
 Del Monaco on diphtheria antitoxin, 480.
 Delafield on posttyphoid sepsis, 21.
 Delestre and Hutinel on treatment of hemorrhagic disease of newborn, 253.
 Delhi sore, protozoa in, 316.
 Delirium, alcoholic, protracted, 420.
 Demarest on hemorrhage from respiratory tract, 166.
 Demarque and Labbé on Klebs-Löffler bacillus in impetigo and ecthyma, 292.
 Demay de Certant on cocaine hydrochlorate and adrenalin in, 473; hemorrhoids, 474.
 Dementia, multiple sclerosis with, 383; paretic, 418; paretic, *Bacterium coli* in development of, 418; paretic, blood in, 418; paretic, etiology, 418; paretic, salt-solution in, 419; paretic, syphilis in, 418.
 Denis on bradycardia in diphtheria, 243.
 Dennett (D. C.) on röntgen rays, 453, 509.
 Derlin and Neisser on lipemia in diabetes, 89, 633.
 Dermacentor reticulatus, 70.
 Dermatitis, acute, from satin-wood irritation, 436; blastomycetic, 427; herpetiformis in children, 429; infectious, in chronic morphinism, 436; röntgen ray, as influenced by idiosyncrasy, 456.
 Dermatobia noxialis as cause of tropical cutaneous myiasis in man, 426.
 Dermatoses, papular exudative, from pilocarpin, 436.
 Desanti on collargol, 488.
 Desquamation in typhoid fever, 15.
 Deutsch on purgen in diseases of children, 293.
 Development, diseases of, in children, 273.
 Developmental defects of skin and their malignant growths, 438.
 Dewar on iodoform in tuberculosis, 45.
 Dextrocardia, 147.
 Dextrose and levulose in urine, coincident appearances, 82; ratio to nitrogen, in urine in diabetes mellitus, 636.
 Diabetes, carbon dioxide in, 529; changes of spinal cord in, 382; chemistry, 637; excretion of oxalic acid, indican, acetone, and conjugated sulfates in, 636; insipidus, 91; insipidus, ependymitis in fourth ventricle in, 91; insipidus, polyuria in, strychnin in, 91; insipidus, reflex immobility of pupils in, 91; insipidus, strychnin nitrate in, 513; lipemia in, 633; mellitus, 81; mellitus, arteriosclerosis and, relation, 87; mellitus, aspirin in, 484; mellitus, bronzed, 88; mellitus, changes in spinal cord in, 89; mellitus, complications, 87; mellitus, Dupuytren's contracture in, 87; mellitus, etiology, 84; mellitus, family, 88; mellitus, in myxedema in children, 274; mellitus, levuretin in, 91; mellitus, lipemia in, 88, 89; mellitus, nature, 84; mellitus, oats in, 90; mellitus, polyuria in, secale in, 91; mellitus, potatoes in, 90; mellitus, ratio of dextrose to nitrogen in urine in, 636; mellitus, sugar-formation in, 636; mellitus, symptomatology, 87; mellitus, terminating in coma, 88; mellitus, treatment, 90; mellitus, tuberculosis and, relation, 87.
 Diabetic persons, children of, 271.
 Diabetic acid in recurrent vomiting, 272.
 Diamidoacids, fate of, 635.
 Diapason in auscultatory exploration, 160.
 Diaphragmatic pleurisy, diagnosis, 162, 163.
 Diarrhea from pollution of public water-supply, 186; of children from streptococcus, 259; of children, gelatin in, 259; of children, lymphocytes in, 260; of children, polymorphonuclear cells and lymphocytes in, 260; summer, of children, atropin in, 259; summer, of children, danger of contagion in baby-wards in, 259; summer, of children, Flexner's serum in, 258; summer, of children, relation of bacillus of Shiga to, 258; summer, of children, streptococcus in, 259.
 Diastase enzyme in saliva of infants, 236; ferment in human milk, 232.
 Diathesis, neurotic, in adults, use of opium in infancy as cause, 285.
 Diazo-reaction, Ehrlich's, 203, 204, 655.
 Dickson and Lassalle on varioloid variella, 56.
 Dide and de la Touche on chronic thyroiditis, 342.
 Diefendorf on blood in paretic dementia, 418.
 Dienert on nitrites in drinking-water, 606.
 Dising on treatment of frambesia, 452.
 Diet, starchy, excessive, as cause of enuresis in children, 281.
 Dietetics, 535.
 Dieudonné on tuberculosis in children, 249.
 Digestion, pancreatic, arginin and lysin end-products of, 630; physiologic chemistry, 650; physiology, 530; salivary, physiology, 532.
 Digestive organs, diseases of, 167; power of ptyalin, action of salts on, 532; tract, acute transitory edema of, 107; tract, bacteriology and pathology, 355; tract of children, acute inflammations of, breast-milk in, 260; tract, protection from sharp bodies, physiology, 532.
 Dight on borax and boric acid, 485.
 Digitalis, 490; effect on heart, 490; in disturbances of conductivity of heart, 137; in pneumonia, 492; producing extra systoles, 138.
 Digitoxin, 490; effect on heart, 491.
 Dillingham on rubella, 245.
 Dimethylamidobenzaldehyd reaction, Ehrlich's, as test for indol in feces, 185.
 Dionin, 492; in affections of eye, 492.
 Dipeptid, 622.
 Diphtheria and scarlatina, differential diagnosis, 240; anorexia in, 243; antitoxin, 480; antitoxin, immunization with, 588; antitoxin, prophylactic injections of, 244; antitoxin, results from, 587; bacillus in coryza, 243; bacillus in impetigo and ecthyma, 292; bacillus in throats of sick and well, 585; bacillus in vaccinia, 315; bacillus, persistence, 243; bradycardia in, 243; catar-

- rhal, 241; confirmatory cultures in, 587; cryosecopy in, 240; diagnosis, clinical and bacteriologic, 242; epidemics of, increase of simple sore throat in, 240; examining smears made from swab in, 242; gauze shield in examining throat for, 242; in birds, 587; in European armies, 615; leukocytes in, 243, 244; membranous, 241; mild washes in, 243; milk as cause, 241; mortality of, influence of serum treatment on, 244; secondary anemia in, 270; sudden death in, 64; toxin, action on kidney and spleen, 351; toxin and antitoxin of, action on blood and hematopoietic organs, 330; transmission by water, 585.
- Diphtheric erythema intertrigo, 292.
- Diplococcus infection in typhoid fever, 303; rheumaticus, 308; rheumaticus, acute rheumatism and, 308.
- Dirksen on anemia from *Tenia solium*, 228.
- Disability from accident, medicolegal aspects, 553.
- Disinfectants of bile-passages, 202.
- Disinfection, 593; in dysentery, 595; in typhoid fever, 595; of dwellings, 594; with bromin, 594; with corrosive sublimate, dangers, 595; with formaldehyd after Esmarch's method, 596; with formalin, 593; with hot soda solutions, 594.
- Dispensaries for tuberculosis, 581.
- Disposal of municipal waste, improvements in, 597.
- Distoma *Westermanii* as cause of parasitic hemoptysis, 165.
- Distomum hematobium in bilharzia disease, 78.
- Diuretic substances, action on excretion of bacteria through kidneys, 354.
- Diuretin, influence upon kidneys, 221.
- Diver's palsy, prevention, 602.
- Diverticulums, esophageal, 357; formation of, natural disposition of esophagus to, 356; in anterior wall of esophagus, anatomy and pathogenesis, 356.
- Divorce, syphilis and, 447.
- Dixon and Brodie on vasomotors of lungs, 526.
- Dixon and Wigham on effect of radium on bacterial growth, 503.
- Dock on influence of complicating diseases upon leukemia, 119.
- Dodge and Connor on physical signs in pneumonia, 50.
- Doebert on pericarditis and aspiration of pericardium, 144.
- Donath on ebolin in epilepsy, 414; on lumbar puncture, 374.
- Dönitz (A.) on adrenalin and cocaine, 473.
- Dönitz (W.) on plague case of Dr. Sache, 62.
- Donovan (C.) on Leishman-Donovan bodies, 76.
- Donovan-Leishman bodies, 315, 316; bodies in cachexial fevers, 316; bodies in kala-azar, 316; disease, 76.
- Dopter on *Streptococcus scarlatinae*, 239.
- Double consciousness, 546.
- Dracontiasis, 79.
- Dreser on theocin, 514.
- Dressler on aristochin in asthma, 483.
- Dreuw on hydrochloric acid in lupus, 451.
- Drew on alcoholism as cause of insanity, 558.
- Dreyer on eosin stains and phototherapy, 462.
- Drinking-water, nitrites in, 606.
- Dropsy, cardiac, in children, theocin in, 293, 294; damage of capillary walls as cause, 134; disturbances of compensation of heart in relation with, 134; idiopathic, of childhood, 273; theocin in, 514.
- Drowning, apparent death by, resuscitation in, 530; death by, 530.
- Druelle and Emery on delayed secondary manifestations of syphilis, 447.
- Drug eruptions, 434; eruptions, proprietary, 435; eruptions, syphilis and, differential diagnosis, 444; inspection, 608; legislation, defects, 612.
- Dubousquet-Laborde on epidemic icterus, 198.
- Ducceschi on coagulation of blood, 517.
- Duchenne-Erb brachial paralysis, operative treatment, 376.
- Duckworth on diet in gout, 96; on pemphigus vegetans, 430.
- Ductless glands, diseases of, in children, 273.
- Duffloq and Voisin on attempt at suicide from typhoid bacillus, 539.
- Dunbar on anesthesin, 476; on iodine in goiter, 497; on urine in beriberi, 64.
- Dunbar's antitoxin, 494.
- Duncan on typhoid fever in India, 17.
- Duncanson on adrenalin in hemoptysis, 473.
- Dunckel on second attack of scarlatina, 240.
- Dunger on cystic kidney, 353.
- Dunn on iodine reaction in blood of children, 271.
- Dunn and Rotch on pulmonary osteoarthropathy in child, 275.
- Duodenal ulcer complicating acute eczema pustulosum in infant, 292.
- Duprey on *Ascaris lumbricoides*, 224.
- Dupuytren's contracture in diabetes, 87.
- Dura, endothelioma of, 396.
- Durante's solution of iodine, 497.
- Durig on oxygen consumption, 529.
- Dutton and Todd on trypanosomiasis, 72.
- Dutton, Todd, and Christy on trypanosomiasis, 75.
- Dwarf tapeworm, 227.
- Dwellings, disinfection of, 594.
- Dwiejluy on theocin, 514.
- Dyes, anilin, 611; hair-, dangers, 572.
- Dying declarations, 550.
- Dysenteric toxin, 332.
- Dysentery, 190; amebic, 191; amebic, cramp in muscles in, 192; antitoxin, 192; *Aplopappus Baylahuen* in, 193; bacillary, in, soldiers, 193; bacillus group, 305; cardiac disorders in, 192; conjunctivitis in, 191; disinfection in, 595; hydrogen dioxide in, 192; in Berlin, 190; malarial, 193; mucous membrane of, in dysentery, 192; olive-oil in, 193; serum for, 477; tropical, chronic, olive oil in, 500; tropical, *Cortex granati* in, 193; urethritis in, 191.
- Dysentery-toxin, 190.
- Dyspepsia in children, intolerance for milk in, 260.
- Dyspeptic pertussis, 246.
- Dyspeptine, 179.
- Dyspnea in pharyngeal croup, treatment, 261.
- EARTH-burial, sanitary aspect, 598.
- Eastman on osmic acid in tie douloureux, 500.
- Ebstein on exodin, 188, 493.
- Eccles on use of food preservatives, 610.
- Eclampsia in children, 285; in children, blindness and deafness after, 286.
- Ecthyma, Klebs-Löffler's bacillus in, 292.
- Eczema, aural, pruritus from, treatment, 442; clay pastes in, 450; empyroform in, 450; impetiginous, in children, nephritis after, 283; in children, 292; in children, bromocoll in, 292; pustulosum, acute, in infant, duodenal ulcer complicating, 292; Röntgen rays in, 507.
- Edel on cyclic albuminuria in children, 282.
- Edel (P.) on chronic interstitial nephritis, 220.
- Edel (R.) on cyclic albuminuria, 210.
- Edema, acute transitory, 106; acute transitory, beneath periosteum, 106; acute transitory, of digestive tract, 107; acute transitory, of gastric mucous membranes, 107; acute transitory, swelling of larynx from, 106; general idiopathic, 107; idiopathic, 107; 106; arteriosclerosis, 153; in hemiplegia, 396; in marantic children, relation of proteids to, 276; of glottis in child, 262; of lungs, acute suffocative, 164.
- Edge on rheumatic hyperpyrexia, 54.
- Edgeworth (F. H.) on gelatin-injections in aortic aneurysm, 157.
- Edlefsen on acute sigmoiditis, 187.
- Edmunds (A.) on regeneration of nerve-fibers, 540.
- Edmunds (C. W.) on quantity of urine passed during day and night, 216.
- Edsall on biologic differences between human milk and milk of animals, 231; on chemistry

- of diabetes, 637; on collargol in chorea, 488; on lymph-glands in typhoid fever, 14; on staphylococcal infection of skin in typhoid fever, 20; on Still's type of chronic polyarthritis, 272.
- Edsall and Fife on gastric carcinoma, 181; on milk modification, 235.
- Edsall and Ghiskey on hospital-epidemic of pneumococcus-infections, 47.
- Edsall and Lavenson on chronic polyarthritis, 99.
- Edwards on relation between tuberculosis in children and varicella gangrenosa, 246.
- Egg-albumin, infantile urticaria from, 436.
- Eggs, effect of röntgen rays on, 543.
- Eggs, fertilizing, of sea-urchin, 540.
- Egypt, typhoid fever in, 18; typhus fever in, 66.
- Egyptian anemia, bilharzia infection as cause, 79.
- Ehler on glycosuria, 83.
- Ehrenrooth and Marx on agglutination test for blood, 627.
- Ehrlich on constitution of diphtheria and other toxins, 649; on origin of plasma-cells, 322.
- Ehrlich and Shiga on trypan red in trypanosoma affections, 515.
- Ehrlich's diazo-reaction, 203, 655; dimethyl-amidobenzaldehyd reaction as test for indol in feces, 185.
- Ehrman on pathology of syphilitic initial sclerosis of penis, 446.
- Einhorn on antityphoid serum, 482; on Jex's antityphoid serum, 26; on radium in treating stomach, esophagus, and rectum, 185.
- Eisendrath on adrenalin in shock, 474.
- Elastic tissue in liver in infectious diseases, 356; in ventricle of heart, 348; of spleen, pathology, 342.
- Elder and Matthew on pernicious anemia following parturition, 117.
- Electric conductivity of urine, relation to its chemie composition, 655.
- Electricity in albuminuria, 221; in removal of casts from urine, 221.
- Electrophotocautery, 471.
- Ellinger on tryptophane, 651.
- Elliott on chronic nephritis without albuminuria, 217; on cyclic albuminuria, 211.
- Elliott and Putnam on tumor of spinal cord, 380.
- Ellis and Weems on breakfast foods, 609.
- Elshnig on eye-conditions in nephritis, 216.
- Elsner on diagnosis between esophageal and gastric disease, 182; on hemorrhagic erosions of stomach, 173; on treatment of cardiac toxemia of pneumonia, 53; on typhoid fever, 15.
- Elting on tetanus antitoxin, 514.
- Ely and Snyder on cerebrospinal meningitis, 57.
- Embsen and Salomon on alanin causing increase in sugar-excretion, 636.
- Embolism, 158; of leg after pneumonia, 51; of mesenteric vessels, 158; of right femoral artery in appendicitis, 189.
- Emerson on medical inspection of New York schools, 605.
- Emery and Druelle on delayed secondary manifestations of syphilis, 447.
- Emmerich on bakeries, 611.
- Emmerich and Gemünd on soil as transmitter of cholera and typhoid, 591.
- Emphysema of lungs, 161; etiology, 161.
- Empyema in children, 265; in children, bacteriology, 305; metapneumonic, in children, diagnosis, 265.
- Empyiform in eczema, 450.
- Emulsion-albuminuria, 212, 655.
- Encephalomyelitis, disseminated, in variola, 56.
- Endocarditis, acute, 144; acute, severe disease of blood presenting picture of, 113; gonorrheal, 58; malignant, apyretic form, 144; malignant, with meningitis, 144; septic, acute leukemia and, differentiation, 114; streptococcus, antistreptococcus serum in, 479; tuberculous, diagnosis of, 39.
- Endopericarditis, collargol in, 488.
- Endothelioma of brain in child, 291; of dura, 396.
- End-products of pancreatic digestion, 630.
- Enema, nutrient, absorption of, 631; vomiting in, 178.
- Engineers, railway, visual requirements, 651.
- England, deaths in, registration, 613; infant mortality in, 618; overlying in, 559, 618; tuberculosis in, 585; vital statistics, 614.
- England on Aplopappus Baylahuen in dysentery, 193.
- English on traumatic pneumonia, 48.
- Engman on röntgen rays in acne, 455, 507.
- Enterocolitis, acute, in children, breast-milk in, 260; mucomembranous, in Graves' disease, 98.
- Enuresis, epidural injections in, 370; in children, epidural injections of salt-solution in, 281; in children, excessive starchy diet as cause, 281; in children, masturbation as cause, 281.
- Enzyme, cane-sugar inverting, in gastric juice, 631; diastasic, in saliva of infants, 236; pancreatic, alcohol produced by, 85.
- Eosin, painting tissues with, as enhancing action of light, 471; stains and phototherapy, 462.
- Eosinophilia in diagnosis of trichinosis, 71; in anemia, 226; in bilharzia disease, 79; in dracontiasis, 79; in skin diseases, 440; in those infected with intestinal parasites, 222; in trichinosis, 71.
- Ependymitis in children, 290; in fourth ventricle in diabetes insipidus, 91.
- Epidural injections in disorders of genitourinary system, 370; injections in enuresis, 370.
- Epilepsy, 410; and acidity of urine, relation, 414; Babinski reflex in, 416; cholin in, 414; enlargement of thyroid in, 416; mental condition in, 413; myoclonus, progressive, 415; solanum carolinense in, 511.
- Epileptic attack, distention of stomach before, 416; attack, features, 412.
- Epinephrin hydrate, action of nitric acid on, 648.
- Epithelioma, actinotherapy in, 460; iodid of potassium eruption simulating, 435; papillary, 320; röntgen rays in, 432, 507, 509.
- Epithelium, renal, action exercised in vitro by solutions of sodium chlorid on, 351; injurious action exercised in vitro on, by serums, 351.
- Erb on syphilis in locomotor ataxia, 379.
- Erb on ferments in leukemic blood, 628; on nephritis, 212.
- Erb's palsy, operative treatment, 376.
- Erdheim on aplasia of thyroid gland, 343; on cysts and glandular vesicles of branchiogenic organs, 343; on tumors of thyroglossal duct, 343.
- Ergot in typhoid fever, 26.
- Erlenmeyer on cystein, 630.
- Ernst and Wolbach on morphology of tubercle bacillus, 295; on tuberculins made from tubercle bacillus, 300.
- Erving on blood in rheumatoid arthritis, 100.
- Erysipelas, collargol in, 488; in chronic nephritis, 215; potassium permanganate in, 501; silver fluorid in, 451.
- Erythema exudativum multiforme, recurring membranous stomatitis with, 428; group of skin diseases, visceral manifestations, 437; purpuric, chronic, 427; scarlatiniform, influenzal, 428.
- Erythrocytes, alkalinity of blood and, 109; granules in, appearance and significance, 333; mode of entry of spore into, in malaria, 68, 172; morphologic changes in, significance of, 333; nucleated, in spleen, 115; number of, in children, 268; volume of, in various disease conditions, 334.
- Erythromelalgia, 374.
- Esbach's reagent in diagnosis of gastric carcinoma, 182.
- Escherich on Moser's serum in scarlet fever, 479; on tetany in children, 286.

- Esmarch's method of disinfection with formaldehyd, 596.
- Esmenard on Babinski sign in epilepsy, 416.
- Esophageal cardiac glands, inferior, in upper esophagus, glands resembling, 355; disease and gastric disease, differential diagnosis, 182; diverticulums, 357.
- Esophagus, anterior wall, diverticulums in, anatomy and pathogenesis, 356; carcinoma of, pathology, 168; diseases of, 167; lymphatic vessels and glands connected with, 167; natural disposition of, to formation of diverticulums, 356; stricture of, cancerous, radium in, 504.
- Essential dropsies of children, 273.
- Esser on right-sided hydrothorax, 134.
- Ether, laking of blood by, 520.
- Ethyl butyrate, platinum black affecting hydrolysis of synthesis of 634; chlorid, 492; chlorid in lupus, 492.
- Ethylendiamin sulfate of mercury in tinea tonsurans in children, 293.
- Eucalyptol, 492.
- Eucalyptus, 492.
- Euglobulin, 208.
- Euphthalmin, 493.
- Euphuin, 493; in malaria, 493; in pertussis, 493.
- European armies, health of, 614; countries, tuberculosis in, mortality, 583.
- Eustis on pemphigus vulgaris, 429.
- Eustrongylus gigas as cause of chyluria, 80; infection, 80.
- Ewald on diseases of gallbladder and bile-ducts, 202.
- Ewart on apparatus for continuous rectal alimentation, 180; on treatment of chorea in children, 255.
- Ewing on vaccine bodies, 313.
- Exanthema, mercurial, 437.
- Excision of lupus, 431.
- Exercise and pulse-rate, 524.
- Exercises, gymnastic, in disturbances of circulation, 149.
- Exner on effect of adrenalin on absorption, 472, 534; on radium, 504.
- Exodin, 493; as laxative, 188; in constipation, 188.
- Exophthalmic goiter, 96, 402; cardiac symptoms, 96, 402; goiter, disturbances of respiration in, 97; iodine in, 497; mucomembranous enterocolitis in, 98; psychoses and, relation, 97; relation of parathyroid gland to, 406; serum for treatment of, 402.
- Experimental therapeutics, 469; tuberculosis, 297; variola in monkey, 310.
- Extirpation of kidney, unilateral, changes in gastric secretion after, 170.
- Eye, diseases of, dionin in, 492; diseases of, ichthargan in, 496; effect of adrenalin on, 473, 538; effect of radium on, 502; loss of, damages for, 554, 555; wounds of, infected, collargol in, 489.
- Eye-conditions in nephritis, 216.
- Eyelid, upper, and lower jaw, associated movements of, 374.
- Eykman on deglutition, 530.
- FABER (E.), on mortality of diphtheria, 244.
- Faber (K.), on obliterative appendicitis, 189.
- Fabian on chronic icterus, 165.
- Fabozzi on primary carcinoma of liver, 361.
- Fabre on herpes zoster in children, 292.
- Face, black mask of, 439.
- Facial atrophy, 393; palsy, 394.
- Fairbanks on idiopathic or essential dropsies of children, 273.
- Fairbrother on combination of carbolic acid and nitric acid dangerously explosive, 487.
- Faith-cure, medicolegal aspects, 553.
- Falkenstein on gout, 94.
- Falta and Neubauer on destiny of aromatic acids in alkaptonuria, 623.
- Family ataxia, 383; diabetes, 88; periodic paralysis, 371.
- Fano on heart nerves, 524.
- Fat, absorption after ligation of ducts of pancreas, 633; absorption of, 534; blood-serum agglutinates, 632; carbon tetrachlorid for extraction of, 633; formed from cell-proteids, 632; in milk, quantity of, 233; influence on formation and excretion of acetone, 554; influence on gastric secretion, 177; physiologic chemistry, 632; split before absorption, 633.
- Fat-formation, 536.
- Fat-free milk, acidulated, in gastroenteritis of infants, 236.
- Fat-injections, subcutaneous nutritive, 179.
- Fat-splitting ferment of gastric juice, 170.
- Fat-splitting ferments as cause of changes in canned butter, 633.
- Fatty acids, higher, synthesis of, in liver, 632; content of blood, 337; contents of various organs, 337; degeneration, physiologic chemistry, 632; extract, lecithin content, 632; liver, fatal effects of chloroform on children with, 257.
- Faust on sepsis, 631.
- Fazio on malignant endocarditis, 144.
- Fecal pollution, bacterium coli as indicator of, 607.
- Feces, blood in, 169; examination of, 185; indol in, Ehrlich's dimethylamidobenzaldehyd reaction as test for, 185; method of dividing, 185; Oppler-Boas bacilli in, in gastric hemorrhage, 184; proteids absent from, 631.
- Feculent vomiting in tabes dorsalis, 172.
- Feeble-mindedness, rachitic form, 278, 279.
- Feer (E.) on eczema in infants, 292.
- Feet, hyperidrosis of, potassium permanganate in, 501.
- Fehling on collargol in puerperal fever, 488.
- Fehling's solution, reduction of, in icteric urine, 81.
- Fehrsen on blood of newborn, 522.
- Felchenfeld on cause of insomnia, 133; on strychnin in polyuria in diabetes insipidus, 91.
- Femoral artery, right, embolism of, in appendicitis, 189.
- Fenyvessy on glycuronic acid, 638.
- Ferguson on leukocytosis of variola, 56.
- Ferguson and Cowan on congenital heart-disease, 267.
- Ferment, diastasic, in human milk, 232; fat-splitting, as cause of changes in canned butter, 633; glycolytic, 85; glycolytic, leukocytes and, 85; glycolytic, of liver, 626; in liver capable of hydrolyzing potassium myronate, 633; in milk, 231, 640; in muscle of mummy, 630; in skin, 633; interaction, in destruction of sugar, 637; peptic and tryptic, in leukemic blood, 648; rennet, activity, 647; oxidizing, in milk, 232; temperature at which destroyed, 634.
- Fermentation, alcoholic, 84; lactic acid, 84.
- Ferments, 633.
- Fernando on malaria in Ceylon, 69.
- Fernet on enlargement of axillary glands in tuberculosis, 41.
- Ferrari on viscosity of blood in asphyxia, 519.
- Ferranini on arsenic poisoning, 770; on aortic insufficiency, 145; on bile-pigments in icterus, 195.
- Ferrari on periarthritis nodosa, 346.
- Ferrari and Slaughter on antiplague serum, 477.
- Ferric chlorid, reaction to, in cirrhosis of liver, 199.
- Ferrous sulphate, inefficiency of, as antiseptic, 594.
- Fertilizing eggs of sea-urchin, 541.
- Fetal age in premature birth, röntgen rays to assist in diagnosis, 574; typhoid fever, 238.
- Fetus, thymus glands in, 273; variola in, 55.
- Feuerstein on Justus test for syphilis, 447.
- Fever attacks during infancy, 250; continued, 23; excretion of glycuronic acid in, 81; increased proteid decomposition in, 634; influence on excretion of sugar, 86, 87; metabolism in, 15, 634; physiologic chemistry 634; proteid metabolism in, 634.
- Fibers, inspiratory, in vagus, 529; nerve-, regeneration of, 540.

- Fibrinoglobulin, 208.
 Fibroid nodules, subcutaneous, in arthritis deformans, 101.
 Fibrosis of heart, 348.
 Fichera on removal of spleen in dogs, 361.
 Field on Mallory's Cyclaster scarlatinalis in scarlet fever, 315.
 Fife and Edsall on gastric carcinoma, 181; on milk modification, 235.
 Fifth cranial nerve, sensory distribution, 386.
 Figari and Marzagalli on antituberculous serum, 481.
 Filaria diurna, 77; nocturna, 77; perstans, 77; perstans, relation to tick fever, 78.
 Filarial fevers, 77.
 Filariasis, 77; banana and, relation, 77; in Porto Rico, 77; lymphangitis and, 77; recurrent lymphangitis in, ichthyol in, 78.
 Filatov on hereditary syphilis, 449.
 Filatov on la grippe resembling latent tuberculosis, 237; on typhoid fever in children, 237.
 Filia on ferments of milk, 640; on mother's milk, 231; on nephritis after impetiginous eczema in infants, 283.
 Filix mas in ankylostomiasis, 227.
 Filmaren, 484; in tænie, 228.
 Findlay on obtaining sputum from children, 262.
 Finger, club-, 104.
 Finkelburg on diabetes insipidus, 91.
 Finsen light, 470; in lupus, 454, 470, 471; in skin diseases, 458, 470, 471; with London Hospital lamp, 460, 461.
 Finsen (N. R.) on red light in smallpox, 504.
 Fischer on gastric vertigo, 172; on polypeptids, 642; on resistant polypeptids, 642; on synthesis of tripeptids, 643.
 Fischer (B.) on pathology of elastic tissue of spleen, 342; on primary cancer of liver, 360.
 Fischer (L.) on diphtheria antitoxin, 244.
 Fischer (M. H.) on effect of salts on urinary secretion, 539.
 Fischer (W.) on veronal, 515.
 Fischer and Abderhalden on polypeptids, 642; on process of enzym action in producing α -pyrrolidin carbonic acid or phenylalanin from proteids, 643.
 Fischer and Leuchs on glucosamin, 635.
 Fischkin on röntgen rays, 456.
 Fish in cause of leprosy, 66.
 Fisher on bronchiectasis following measles, 263; on cardiac disease in chorea, 255.
 Fisher and Symes on primary seat of infection in tuberculosis, 34.
 Fistula, gastrocolic, gastric carcinoma resembling, 181.
 Flandrin and Ramond on fat split before absorption, 633.
 Fleig on sapokrinin, 647.
 Fletcher on nutrition, 611.
 Flexner and Noguchi on antivenin, 482, 483; on crotalus antivenin, 651.
 Flexner's serum in summer diarrhea of children, 258.
 Flint's murmur, 131.
 Floating liver, 201.
 Flour, banana, 608; bread made from finer grades, 631.
 Flüge on bacteriology of ink, 619; on tuberculosis, 31; on ubiquity of tubercle bacillus, 31, 581.
 Fluorescence, artificial, therapeutic effects, 509.
 Fluorescein, transillumination of stomach with, 169.
 Foa on osmotic pressure of corpuscles and serum, 520.
 Foissy on combining adrenalin with cocaine, 472.
 Folin on determination of creatinin, 629.
 Food, adaptation of pancreas to, 631; adulteration of, 609; arsenic in, 624; borated, effect on kidneys, 640; breakfast, analysis, 609; cereal, 608; inspection, 608; nature and consistence, as influencing length of sojourn in stomach, 531; preservatives, borax and boric acid, 611; preservatives, sulfurous acid, 610; preservatives, use, 610; regulations in New South Wales, 610; sodium chlorid of, influence on gastric juice, 647; value of alcohol, 608.
 Food-stuffs, influence on secretion of gastric juice, 177, 531.
 Foot-and-mouth disease, epizootic of, acute infectious pemphigus during, 430.
 Foots on osteitis deformans, 103.
 Forbát-Fischer on snow-removal, 599.
 Forbes on hypodermatic medication in syphilis, 449.
 Ford and Halsy on hemoagglutinins and hemolysin, 325.
 Foreign bodies as cause of gallstones, 201.
 Formaldehyd, 493; disinfection with, after Esmarch's method, 596; effect on hemolysis, 521; in tuberculosis, 45; poisoning, 571.
 Formalin, disinfection with, 593; in whooping-cough, 493; intoxicant action, 596; poisoning, 493.
 Formol in hyperidrosis plantaris, 451.
 Forsyth on antiplague serum, 477.
 Fortescue-Brickdale on collargol, 489.
 Foster on chronic gastritis from alcohol, 173.
 Foudroyant typhoid, 15.
 Fourth ventricle, ependymitis in, in diabetes insipidus, 91.
 Fox and Macleod on Paget's disease of umbilicus, 433.
 Fracture of coccyx and sprained ankle, damages for, 555.
 Fraczkiewicz on hedonal, 495.
 Fraenckel (P.) on relative volume of corpuscles and plasma, 519.
 Fraenkel (A.) on digitalis, digitoxin, and strophanthus, 491.
 Fraenkel (L.) on corpus luteum, 537.
 Fraenkel and Hunt on neurofibroma of acoustic nerve, 389; on tumors of pontomedullo cerebellar space, 395.
 Frambesia, treatment, 452.
 Franca and Bettancourt on cerebrospinal meningitis, 593.
 Franke on aspirin poisoning, 571.
 Frankenburg on mesotan in rheumatism, 499.
 Fraser on lipemia in diabetes, 88.
 Frazier on trifacial neuralgia, 384.
 Freeman on exponents of well-being in children, 237.
 Freeman (R. G.) on tuberculosis in infancy, 249.
 Freezing-point of blood, effect of sweating on, 648; of kidneys, determination, 324; of milk, lowering, 640.
 Fremitus, vocal, of abdomen, 170.
 French attitude toward privileged medical communications, 576.
 French on eosinophilia in skin diseases, 440.
 Freudenburg on phosphaturia, 205.
 Freund on relation between water and salts and changes in body-weight of infants, 233.
 Friedenthal on reaction of blood, 522.
 Friedmann on formula for cystin, 629.
 Friedmann (F. F.) on immunization against tuberculosis, 47, 482.
 Friend on prostatic crises in tabes, 379, 380.
 Fromherz on polycythemia of congenital heart-disease, 271.
 Fry and Martin on examination of urine from infants, 280.
 Fuchs (E.) on urotropin in typhoid fever, 515.
 Fuchs (R.) on iodipin, 497; on migraine, 416.
 Fukuhara on action of hemolytic toxins in organism, 328.
 Field and Hewlett on coagulation of blood, 518.
 Fuller on mortality from typhoid fever, 606, 607.
 Fuller (A. W.) on nasopharyngeal condition in cough, 247.
 Fulton (H.) on quinin in hay-fever, 501.
 Fulton (J. S.) on typhoid fever, 11.
 Furunculosis, staphylococcus vaccine in, 453.
 Fusiform bacillus from tonsillar ulcer, 251.
 Fitcher on amebic infection, 191; on gout in United States, 95; on relation between uric acid and phosphoric acid excretion in gout, 93.
 Fyshe, McCrae, and Ainley on lobar pneumonia, 49.

- GAILLETON on hypodermatic medication in syphilis, 450.
- Galdi on essential chorea of heart, 399.
- Galdi and Tarugi on relation between epilepsy and acidity of urine, 414.
- Galeotti on alkalinity of blood, 627.
- Gallbladder disease, relation to surgery, 202.
- Galli on musical heart-murmurs, 131.
- Galli-Valerio on lysoform, 498.
- Gallstones, chemic pathology, 201; etiology, 201; foreign bodies as cause, 201; from constitutional derangement, 202; intestinal obstruction from, 195.
- Galvagno on chronic gonorrheal peritonitis in children, 284.
- Gamma rays, 502.
- Ganghofner on intestinal tuberculosis in children, 249.
- Ganghofner and Langer on biologic test for detecting albumin, 646.
- Gangitano on adrenalin and cocain in operations, 872.
- Ganglions of heart, pathologic conditions in, 147.
- Gangrene from carbolic acid, 486; from mercury injections in syphilis, 450; of kidney, 219; primary, of throat, in child, 256.
- Gangrenous varicella and tuberculosis in children, relation, 246.
- Garlic in tuberculosis, 44.
- Garnier and Roger on thyroid gland in variola, 343.
- Garrison, Ransom, and Stevenson on intestinal parasites, 222.
- Garrod on black urine, 205.
- Gärtner on method of measuring pressure on right auricle of heart, 130.
- Gas, carbonic acid, poisoning from, 568; illuminating, poisoning from, 568, 573.
- Gassmann on histologic appearances of Röntgen-ray ulcer in rabbit, 457.
- Gastric carcinoma, 180; carcinoma and phlegmonous gastritis, combined, 181; carcinoma, diagnosis, Esbach's reagent in, 182; carcinoma, diagnosis, Oppler-Boas bacilli in blood-clots in, 183; carcinoma, diagnosis, serum-albumin in stomach contents in, 181, 182; carcinoma, HCl-hyperacidity in, 180; carcinoma, Oppler-Boas bacilli in blood-clots in diagnosis of, 183; carcinoma, Oppler-Boas bacilli in urine in, 184; carcinoma, prophylaxis, 184; carcinoma, radium in, 184; carcinoma resembling gastrocolic fistula, 181; carcinoma, serum-albumin in stomach-contents in diagnosis of, 181, 182; carcinoma, serum-diagnosis, 184; contents, Oppler-Boas bacilli in, 183; contents, urobilin in, 196; crises in tabes dorsalis, 171; disease and esophageal disease, differential diagnosis, 182; disease, chronic, fluid diet in, 176; disease, chronic, treatment, 176; hemorrhage, Oppler-Boas bacilli in stools in, 184; hyperacidity and hypersecretion, differentiation, 172; hypersecretion, hyoscin in, 496; juice, cane-sugar inverting, 631; juice, excessive secretion, scopolamin in, 511; juice, fat-splitting ferment of, 170; juice, hyperacidity, 172; juice, influence of sodium chlorid of blood on, 647; juice, physiology, 533; juice, secretion of, influence of food-stuffs on, 531; juice, ultramicroscope in examination of, 648; mucous membrane, islands of, 355; mucous membranes, transitory edema of, 107; proteolysis, 169; secretion, abnormalities of, 172; secretion, changes in, after unilateral extirpation of kidney, 170; secretion, disturbed, absorption of albumin in, 177; secretion, influence of water, carbohydrates, fats, and proteids on, 177; syphilis, 185; tetany, 176; ulcer, 174; ulcer, hemorrhage in, 180; ulcer, occult hemorrhages in diagnosis of, 174; ulcer, operation in, 175; ulcer, perforating, in child, 256; ulcer, treatment, 179; ulcer with fatal hemorrhage from eroded left renal vein, 357; vertigo, 172.
- Gastritis, 173; chronic, 173; chronic, erosions in, 174; chronic, from alcohol, 173; phlegmonous, gastric carcinoma and, combined, 181.
- Gastrocolic fistula, gastric carcinoma resembling, 181.
- Gastroenteritis in children, acidulated fat-free milk in, 236; blood in, 260.
- Gastrointestinal catarrh of children, 260; disease of children, whey in, 236; troubles, massage in, 177.
- Gathmann on potassium iodid, 497.
- Gatin-Gruzewski and Biltz on ultramicroscope, 654.
- Gaucher on treatment of senile pruritus, 443.
- Gaudier and Camus on lymphangioma of tongue, 255.
- Gaultheria, oil of, poisoning from, in child, 294.
- Gautier on arsenic in food, 624; on dangers of hair-dyes, 572.
- Gauze shield in examining throat for diphtheria, 242.
- Gay on diphtheria antitoxin, 480.
- Gelatin, 494; and calcium, relation to blood coagulation, 628; as hemostatic, 494; in aneurysm, 494; in aortic aneurysm, 157; in diarrhea of children, 259; in hemorrhagic disease of newborn, 253.
- Gemünd and Emmerich on soil as transmitter of cholera and typhoid, 591.
- Gengou and Bordet on blood coagulation, 628.
- Genital apparatus, anomalies in, as cause of chlorosis, 116.
- Genitourinary system, bacteriology and pathology, 349; diseases of, in children, 280; disorders of, epidural injections in, 370; tuberculosis of, 302.
- Gerassimovitch on bloody vomit, 258.
- Gerhardt on intermittent pulse, 524.
- Gerhartz on veronal poisoning, 567.
- Germany, mortality statistics, 614; notifiable diseases in, 593; sanatoriums for tuberculosis in, 581; smallpox in, 590.
- Getman and Amidon on gouty phlebitis, 95.
- Geyer on helmet in pyonephrosis, 495.
- Geyser on Röntgen rays, 509.
- Ghriskey and Edsall on hospital-epidemic of pneumococcus-infections, 47.
- Gianelli on formaldehyd, 494.
- Giant-cells, histogenesis, 322.
- Giant-colon in children, 274.
- Gies on ureine of Moor, 655.
- Gies and Hart on diabetes terminating in coma, 88.
- Gies and Hawk on influence of external hemorrhage on chemic changes, 627.
- Gies and Posner on combination of mucoids with other proteids, 645.
- Gieschen, Kerley, and Myers on acidity of cow's and human milk, 231.
- Giesel on effect of radium on retina, 502.
- Gilbert and Lion on experimental arterial atheroma, 345.
- Gilbert and Weil on acute leukemia, 340.
- Gilchrist on blastomycetic dermatitis, 427.
- Gilman on aphasia in measles, 245.
- Gilman and Baetjer on effect of röntgen rays on eggs, 543.
- Gittings on edema of glottis in child, 262.
- Given on hyoscin poisoning, 496.
- Glaessner on pancreatic juice, 533.
- Gland extracts, combined, proteolytic power, 630.
- Glands resembling inferior esophageal cardiac glands in upper esophagus, 355.
- Glandular apparatus in children, generalized tuberculosis of, 250; vesicles of branchiogenic organs, 343.
- Gley and Richaud on gelatin, 494; on relation of gelatin and calcium to coagulation of blood, 628.
- Globulin, transformation of albumin into, 645.
- Glogner on thiosinamin in stenosis of pylorus, 515.
- Glossina palpalis, 73.
- Glossitis, phlegmonous, 167.
- Glottis, edema of, in child, 262; spasm of, in children, 286.
- Glucosamin, 635.

- Glucose, 635.
 Glycerin, sugar from, 636.
 Glycerinated bone-marrow in rachitis, 279.
 Glycogen in inflammation, significance, 323; in suppuration, significance, 323; reaction in blood, 116; reaction in blood in appendicitis, 116; reaction of leukocytes, 115; ultramicroscopic appearance, 653.
 Glycolysis, 84, 637; products of, in blood upon standing, 637.
 Glycolytic action of pancreas, 85; ferment, 85; ferment and leukocytes, 85.
 Glycosuria, 81, 83; alimentary, 655; alimentary, condition analogous to, 627; cholelithiasis in, 83; diabetic and nondiabetic, in same individual, 83.
 Glycuronic acid, 638; excretion of, in fever, 81.
 Goadby on sprue, 188.
 Godinho on Vital Brazil's antipalague serum, 477.
 Goiter, exophthalmic, 96, 402. See also *Exophthalmic goiter*.
 Goldberg and London on radium, 467.
 Goldmann and Wolff on Behrendt's method of estimating sugar in urine, 82.
 Goldschmidt on Marnorek's tuberculosis-serum, 46.
 Gollner on levuretin in diabetes, 91.
 Goltman on quinin poisoning, 570.
 Golubow on etiology of emphysema of lungs, 161.
 Gonococcus infection, 58.
 Gonorrhea, ichthargan in, 496.
 Gonorrheal arterial thrombosis, 58; arthritis in children, 285; cystitis, ichthargan in, 496; endocarditis, 58; infection, general, 58; peritonitis, acute, in children, 284; peritonitis, chronic, in children, 284, 285; pyemia in children, 285; urethritis, ichthargan in, 496.
 Goodall and Paton on effect of removal of thymus, 537.
 Goodwin, Park, and Collins on dysentery bacillus group, 305.
 Gordon on diabetes mellitus in myxedema, 274.
 Gordon, Peacocke, and Scott on splenic anemia, 125.
 Gotschlich and Kolbe on cholera, 62.
 Gotthell on actinotherapy, 459; on sublamina in parasitic diseases of scalp, 452; on sublamina in tinea tonsurans, 293, 513.
 Gottlieb and Magnus on digitalis, 490.
 Gould on eosinophilia in diagnosis of trichinosis, 71.
 Gouraud on metabolism of phosphorus in tuberculosis, 39.
 Gout, 92; among poor, 94; among poor, malt liquor as cause, 95; diet free from purin-bodies in, 93; diet in, 96; etiology, 92; from disease of HCl-producing glands of stomach, 94; granular kidney and, relation, 93; in tropics, 95; in United States, 95; joint-pains in, guaiac in, 95; joint-pains in, sulfur in, 95; nature, 92; necroses in, 92; physiologic chemistry, 638; quinic acid in, 501; relation between uric-acid and phosphoric-acid excretion in, 93; symptomatology, 94; treatment, 95; urate-deposits in tissues in, 92; vegetable foods in, 95.
 Gouty phlebitis, 95.
 Grafting, heterothyroid, 538; of suprarenal tissue, 538.
 Graham on diphtheria antitoxin, 244.
 Granular kidney and gout, relation, 93.
 Granulations of leukocytes, 114.
 Granules in erythrocytes, appearance and significance, 333.
 Granuloma, tubercular, double, in child, 291.
 Grassmann on morphin in cardiac conditions, 499.
 Graves' disease, 96, 402. See also *Exophthalmic goiter*.
 Gray on pernicious anemia, 118.
 Gray and Greig on lymphatic glands in sleeping-sickness and trypanosomiasis, 75.
 Great Britain, extinction of rabies in, 591.
 Greece, tuberculosis in, 583.
 Greef on action of radium on eye, 502.
 Green on chloroform, 487.
 Green urine, 206.
 Greenfield on capacity to assimilate sugar in childhood, 235.
 Greig (D. M.) on röntgen ray in mycosis fungoides, 432.
 Greig (E. D. W.) on lymphatic glands in sleeping-sickness, 374.
 Greig and Gray on lymphatic glands in sleeping-sickness, 75, 316.
 Greig, Nabarro, and Bruce on trypanosome theory of sleeping-sickness, 73.
 Griffith on reference to abdominal pain in pneumonia and pleurisy, 264; on typhoid fever in childhood, 238.
 Grober on combination of hydrochloric acid and pepsin, 647; on indigo-red in urine, 656; on pepsin of gastric juice, 634; on spleen in typhoid fever, 14.
 Grocco on cardiac symptoms in Graves' disease, 96, 402.
 Gross on reactions of heart-muscle to salts, 524.
 Gross and Quincke on acute localized edema, 106.
 Grossmann on gout, 93.
 Ground-itch, 225.
 Grouvan on relation of lupus and scrofuloderma to tuberculosis, 35.
 Growth-retarding and bactericidal properties of alcohols, 598.
 Grüber-Widal reaction, jaundice and, 331; macroscopic methods for, 330.
 Grünbaum on typhoid fever in chimpanzee, 13.
 Grünbaum and Mosse on pernicious anemia in child, 271.
 Grünbaum and Sherrington on cerebral cortex, 540.
 Grützner on examination of feces, 185.
 Guaiac in joint-pains in gout, 95.
 Guaiacol carbonate in measles, 247.
 Gualdi on Ehrlich's diazo-reaction, 655.
 Guanase, physiologic chemistry, 626.
 Guanidin, maximum production, 645.
 Guanilylic acid, 641.
 Guarneri bodies in skin of monkeys inoculated with variola-virus, 312; bodies, life-history, 311.
 Gudeman on cereal foods, 608.
 Guenther on strophanthus, 512.
 Guerin on collargol, 489.
 Guerrini on hemolytic and hemotoxic serum, 627.
 Guiard and Lagrain on lumbar puncture for headache in chronic nephritis, 221.
 Guida on depression of tongue in detection of pertussis, 246.
 Guineaworm, life-span of, 79.
 Guinon on intolerance for milk in children with dyspepsia and chronic enteritis, 260.
 Guiraud and Lasserre on lowering freezing-point of milk, 640.
 Gulland on glycogen reaction in blood, 116.
 Gumma of trachea, 168.
 Gumbel on nitrogen distribution in molecule of proteins, 645.
 Gürber and Hallauer on casein from bile, 628.
 Gusanopeludo as cause of tropical myiasis in man, 426.
 Guthrie (C. C.) on effect of formaldehyd on hemolysis, 521.
 Guthrie (L. G.) on fatal effects of chloroform on children with fatty liver, 257.
 Gütig on blood in paratyphoid, 27.
 Gütig and Kast on hypoleukocytosis in typhoid fever, 23.
 Gutmann on multiple intestinal ulcerations, 195.
 Gutschy on coagulation of blood and thrombosis, 339.
 Guttman on ichthargan in diseases of eye, 496.
 Gutzmann on stuttering and stammering in school-children, 603.
 Guyon on chloroform, 487.
 Gymnastic exercises in disturbances of circulation, 149.
 Gynecologic conditions as cause of intestinal disturbances, 186.

- HAAN on angiosarcoma of liver in child, 321.
 Habercamp on blindness from aspidium, 483.
 Haffkine's serum, 477.
 Hair-dyes, dangers, 572.
 Hairy tongue, black, 440.
 Halberstadter and Neisser on eosin stains and phototherapy, 462.
 Hale on atropin methylbromid, 485; on euphthalmia, 493.
 Halkin on Becquerel rays, 468; on effect of radium rays on tissues, 502.
 Hall (A.) on magnesium salts in multiple warts, 433.
 Hall (A. J.) on caffeine in destroying appetite for alcohol, 573.
 Hall (C.) on eucalyptus, 492.
 Hall (J. N.) on tuberculous disease of chest, 38.
 Hall (J. W.) on action of purin substances, 324; on vegetable foods in gout, 95.
 Hall and Cooper on typhoid fever, 16.
 Hall and McGraw on chronic cyanosis with polycythemia and enlarged spleen, 127.
 Hallauer on influence of concentration of urine upon reactions for albumin, 203.
 Hallauer and Gürber on casein from bile, 628.
 Hallberg on alcohol and carbolic acid, 476.
 Halliburton on regeneration of nerve-fibers, 540.
 Hallock on *Tania nana* in soldiers, 228.
 Hallopeau and Vieillard on papular exudative dermatosis from pilocarpin, 436.
 Halsey on sugar-formation in liver, 535.
 Hallucinations, hemianopic, 394.
 Halsey on leucin in synthesis of sugar, 636.
 Halsey and Ford on hemoagglutinins and hemolysin, 325.
 Ham and Head on regeneration of nerve-fibers, 540.
 Hamburger on effect of adrenalin and peptone on circulation, 526; on effect of adrenalin on eye, 538; on pituitary body, 537.
 Hamburger and Koeppel on reaction of blood, 522.
 Hamill and Nicholson on infections of newborn, 252.
 Hamilton (A. S.) on erythromelalgia, 374.
 Hamilton (J.) on influenzal erythema scarlatiniforme, 428.
 Hamilton and Byers on diastolic aortic murmur, 146.
 Hamman on acute leukemia, 120.
 Hammond (G. M.) on strychnin in nervous diseases, 512, 513.
 Hammond (J. B.) on radium in rodent ulcer, 504.
 Hampeln on carcinoma of esophagus, 168.
 Hand, loss of, damage for, 555.
 Hand on breast-feeding, 231.
 Hands, colon bacillus on, 304.
 Hansen on ethyl chlorid in lupus, 492.
 Hansen and Heiberger on syphilis and parietic dementia, 418.
 Happell on continued fever, 23.
 Harbinson on scleroderma, 107; on scleroderma associated with Raynaud's disease and Addison's pigmentation, 403.
 Hare (F.) on amyl nitrite in hemoptysis of phthisis, 45; on mechanism of migraine and asthma, 416.
 Hare (H. A.) on mercury biniodid in aborting acute tonsillitis, 498.
 Harman (N. B.) on veldt sore, 427.
 Harrington on borax, 485; on effect of borated food on kidneys, 640; on sulfurous acid as food-preservative, 610; on mercury cyanid, 499.
 Harrington (T. F.) on typhoid fever, 12.
 Harris (H. F.) on hydrogen dioxid in dysentery, 192.
 Harris (M. L.) on trauma as cause of movable kidney, 218.
 Harris (S.) on tuberculosis in negro, 35.
 Harrison on collargol, 488.
 Harrison and Wills on Finsen treatment with London Hospital lamp, 461; on röntgen rays in skin diseases, 454.
 Hart (C.) on red atrophy of liver, 358.
 Hart (J. S.) on lymphatic leukemia and pneumonia, 122.
 Hart and Gies on diabetes terminating in coma, 88.
 Hartog and Krause on posttyphoidal thyroiditis, 21.
 Hartwell on stuttering and stammering in children, 603.
 Hartwig on pyelitis as cause of remittent fever in children, 280.
 Hartz on benign stenosis of pylorus, 180; on thiosinamin in pyloric stenosis, 515.
 Hartzell on cutaneous syphilis ex juvantibus, 444.
 Hasebrook on gymnastic exercises in disturbances of circulation, 149.
 Hasenkopf and Salge on agglutination in scarlet fever, 239.
 Haskins on strychnin, 512.
 Hasselbach on metabolism experiments, 639.
 Hassin on Obersteiner-Redlich theory of tabes, 378.
 Hauer on metabolism experiments upon vegetarian, 639.
 Hauser on cyclic albuminuria in children, 281; on serum test for blood, 627.
 Haushalter and Richon on lymphadenitis in children, 274.
 Hausmann and Heffter on egg-albumin and sulfur, 648.
 Hawaiian Islands, leprosy in, 66.
 Hawk and Chamberlain on rate of excretion of nitrogen, sulfate and phosphate, 632.
 Hawk and Gies on influence of external hemorrhage on chemic changes, 627.
 Hawthorne on rheumatism, 54.
 Hay on pneumonia, 50.
 Hay-fever antitoxin, 494; etiology, 317; quinin in, 501.
 Head and Ham on regeneration of nerve-fibers, 540.
 Headache in chronic nephritis, lumbar puncture in, 221.
 Head's zones of hyperalgesia in children, 286.
 Health of European armies, 614; of people, effects of good street paving on, 598.
 Heart, action of, influence of local cold upon, 149; activity of, myogenous origin, 136; and bloodvessels in typhoid fever, 153; apex of, displacement in children, 267; arrhythmia of, nervous and organic, 137; bigeminal action, 139; changes in position, 146; chorea of, 399; compensation of, disturbances in relation with dropsy, 134; conductivity of, disturbances, 137; conductivity of, disturbances, digitalis in, 137; dilation of, 143; dilation of, acute, 143; disease, congenital, in children, 267; disease, congenital, in children, polycythemia of, 271; disease, effect of laughter on, 136; disease in chorea in children, 255; disease, influence of high altitude on, 148; disease, quantity of urine passed during day and night in, 216; disease, right-sided hydrothorax in, 134; disease, treatment, 148; disease, valvular, 144; disease, valvular, tabes dorsalis and, relation, 133; diseases, blood-pressure in, 151; diseases, diet of, in relation to hydrops and dropsy, 150; diseases, hemoglobin in, 149; diseases in dysentery, 192; diseases in children, 266; diseases, morphin in, 499; diseases, reduction of fluids in, 150; diseases, regulation of intake of fluid and of sodium chlorid in, 150; diseases, venesection in, 149; displacement, 147; effect of digitalis on, 490; effect of digitoxin on, 491; effect of strophanthus on, 491; fibrosis of, 348; ganglions and nerves of, pathologic conditions in, 147; inflammation of, in children, opium in, 267; irregularity of, 136; lesion, congenital, in children, 266; mammalian, possibility of restoration, after somatic death, 523; massage of, 349; movability of, 146; nephritic hypertrophy of, cause, 213; nerves, 524; nerves and ganglions of, pathologic conditions in, 147; nervous mechanism, survival after somatic death, 525; outlines of, methods of determining, 129;

- pain of, cactus grandiflorus in, 486; rhythm of, irregularities in, 136; right auricle of, method of measuring pressure in, 130; röntgen rays in examination of, 128; semilunar valves of, relative insufficiency of, 131; size of, determining, 130; size of, determining, orthodiagraphic method, 130; syphilis of, 133, 148; systolic murmur at apex of, in arteriosclerosis, 131; ventricle of, elastic tissue in, 348.
- Heart-beat, 522.
- Heart-failure, sudden, 375.
- Heart-murmurs, functional, differentiation from valvular disease in nephritis, 131; musical, origin of, 131.
- Heart-muscle, reactions to salts, 524.
- Heart-sounds, changes in intensity, 129.
- Heat, animal, 539.
- Hecht on locomotor ataxia in negro, 377.
- Hedonal, 495; as hypnotic, 495.
- Heel-jerk reflex, 368.
- Heffter and Hausmann on egg-albumin and sulfur, 648.
- Heiberg and Hausen on syphilis and parietic dementia, 418.
- Heichelheim on Oppler-Boas bacilli in blood-clots in diagnosis of gastric carcinoma, 183.
- Heile on iodoform, 498.
- Helm and Preisich on staining blood-plaques, 109.
- Heinaz on relation of traumatism to development of tumors, 575.
- Heinke on röntgen rays, 506.
- Heitler on influence of excitation of hearing, taste, and smell upon pulse, 136; on reflex depression of pulse, 136; on sphygmogram taken during laughter, 136.
- Hekma on transformation of trypsinogen into trypsin, 630.
- Hektoen on double infection of scarlatina and typhoid fever, 239; on typhoid and scarlet fevers combined, 23.
- Hektoen and Rüdiger on effect of calcium chloride on hemolysis, 521.
- Helcosoma tropicum, 316, 427.
- Heller on Oxyuris vermicularis, 223; on tuberculosis, 34.
- Heller and Wagner on intestinal tuberculosis in children, 249.
- Helly on functional mechanism of spleen, 342.
- Helmitol, 495; in cystitis, 495; in pyonephrosis, 495.
- Hematuria, paroxysmal, 206.
- Hematogenous origin of mast-cells, 115.
- Hematopoietic organs, action of toxin and antitoxin of diphtheria on, 330.
- Hematuria, 207; from ulcerating tuberculosis of papillae of kidneys, 39.
- Hemianopic hallucinations, 394.
- Hemiparesis with paralysis of third nerve in child, 287.
- Hemiplegia, 395; difference of respiratory expansion on two sides in, 395; edema in, 396; movements of superior intercostal muscles in, 395; of gradual onset, value of, in diagnosis of cerebral tumor, 397.
- Hemisystole, cardiac, 139; postmortem, 139; pseudo-, 139.
- Hemoagglutinins, 325.
- Hemoglobin in blood, calorimetric methods in determining amount, 109; in blood, Hoppe-Seyler factor in determining amount of, 109; in cardiac cases, 149; physiologic variations in, in children, 268; poverty, in children, 268; test of Justus for syphilis, 447.
- Hemoglobinuria, 68, 206, 207; paroxysmal, in child, 280.
- Hemoglobinuric fever, 68.
- Hemolysinogens, 521.
- Hemolysins, 325; in animals deprived of spleen, 328; in urine, 330.
- Hemolysis, 520; abnormalities of, in uremic conditions, 217; effect of calcium chloride on, 521; effect of formaldehyd on, 521.
- Hemolytic action of human blood-serum, 328; activity of blood-serum in uremia, 217; serum, 627; toxins in organism, action of, 328.
- Hemopericardium in children, 268.
- Hemophilia, cause, 342.
- Hemoptysis in tuberculosis, 40; in tuberculosis, amyl nitrite in, 45; parasitic, from Distoma Westermanii, 165.
- Hemorrhage, adrenalin in, 473; calcium chloride in, 180; external, influence of chemic changes, 627; from bronchiectases in diagnosis of tuberculosis, 40; from eroded left renal vein, gastric ulcer with, 357; from respiratory tract, 166; gastric, Oppler-Boas bacilli in stools in, 184; gelatin in checking, 494; in gastric ulcer, 180; in splenic anemia, 124; intestinal, in typhoid fever, 20; occult, in diagnosis of gastric ulcer, 174; polyarthritides with, 105; uterine, styptol in, 513.
- Hemorrhagic conditions in newborn, 252; disease of newborn, blood-letting in, 253; disease of newborn, gelatin in, 253; diseases, 127; erosions of stomach, 173; infarct of lung, 165; pericarditis following pleuropneumonia in child, 268; typhoid, 15, 19.
- Hemorrhoids, anal pruritus with, treatment, 443; bleeding, calcium chloride in, 486; cocain hydrochlorate and adrenalin in, 474.
- Hemostatic, gelatin as, 494.
- Hemotoxic serum, 627.
- Henderson on thymus and sexual organs, 536.
- Henderson and Starling on retinal bloodvessels, 528.
- Henoch's purpura, 128; purpura, diagnosis of, intussusception for, 253.
- Henri and Mayer on action of radium on colicoids, 646.
- Hepp's dyspeptine, 179.
- Hering on how long cardiac nervous mechanism survives somatic death, 525; on intermittent pulse, 524; on possibility of restoration of mammalian heart after somatic death, 523; on pseudo-hemisystole and postmortem hemisystole, 139.
- Hermaphroditism in syphilis, 452.
- Herpes zoster in children, 292; arsenic in, 293.
- Herrick on abdominal pain in pleurisy, 162.
- Herter on gallstones, 201.
- Hertz on acute primary pharyngeal tuberculosis in child, 250.
- Hervieux on indoxyl in blood, 628.
- Hess (K.) on theocin, 514.
- Hess (O.) on acanthosis nigrans, 441; on influence of suprarenin of blood-corpuscles, 521.
- Hess and Miller on acute leukemia, 120.
- Heterothroid grafting, 538.
- Heubner on antistreptococcus serum in scarlet fever, 479; on generalized infection with thrush, 256.
- Hewlett on acute suffocative pulmonary edema, 164; on lipase, 633.
- Hewlett and Fuld on coagulation of blood, 518.
- Heyden food-preparation, subcutaneous administration, 178.
- High pressure, influence on microorganisms, 307.
- High-frequency currents in treatment of skin diseases, 463; sparks in treatment of malignant growths, 464.
- Higley on leukocyte-count in typhoid fever, 23.
- Hildersheim and Leathers on synthesis of higher fatty acids in liver, 632.
- Hill and Macleod on caisson disease, 529, 602.
- Hind on sulphonal poisoning, 567.
- Hinselwood on dionin in affections of eye, 492.
- Hirsch on decomposition of sugar by liver and pancreas together, 84.
- Hirsch and Landau on stagnin, 626.
- Höber on reaction of blood, 522.
- Hoche on cirrhosis of liver in children, 257.
- Hochheimer on morbus maculosus werlhofii, 128.
- Hochsinger on congenital laryngeal stridor, 273; on syphilitic hydrocephalus, 251.
- Hodard on ichthyol in mycosis fungoides, 496.
- Hodgson and Neech on carbolic acid in variola, 57, 486.
- Hoelscher on analysis of perspiration, 648.
- Hofbauer (J.) on absorption of fat, 535.
- Hofbauer (L.) on exophthalmic goiter, 97.
- Hoffmann on changes in intensity of heart-

- sounds, 129; on examination of heart, 128; on paroxysmal tachycardia, 140.
Hoffmann (R.) on myeloma, 318.
Hofmeister on treatment of localized pruritus, 442.
Holitscher on alcohol, 475.
Holland and Sutherland on bulbar paralysis in child, 291.
Holloway on corrosive sublimate poisoning, 566.
Holt on abscess of lung in child, 266.
Holt and Park on infant-feeding with milk, 234.
Holtzapfel on family periodic paralysis, 371.
Homburger on hemoglobinuria, 207.
Homburger on veronal and trional, 516.
Hemogentisic acid in urine of alkaptonuria, 623.
Honda on parasitic origin of cancer, 318.
Hönig on syphilitic disease of lungs, 166.
Honigsmann on gastric carcinoma, 181.
Hookworm disease and miner's anemia, 600.
Hopkins on Pinsen light and röntgen ray, 471.
Hoppe-Seyler factor in determining amount of hemoglobin in blood, 109.
Horoszkiewicz, Wrzosek, and Rzegocinski on anilin poisoning, 566.
Horder on antistreptococcus serum in streptococcus endocarditis, 479.
Hospital isolation of scarlet fever, 589.
Hospital-epidemic of pneumococcus-infections, 47.
Hot soda solutions, disinfecting power, 594.
Hot-air, dry, in Bright's disease, 221.
Hourglass deformity of stomach, 176; from kyphosecoliosis, 176.
House refuse, agricultural use, 599.
Housing of Irish population, 616.
Howard on pneumococcal arthritis, 53.
Howard and Perkins on variola, 312.
Howell on cause of vascular shock, 527.
Hoyt and Wood on effect of aspidospermin on respiration, 484.
Huber on serous meningitis in child, 290.
Hueter on tuberculosis of genitourinary system, 302.
Hugounenq on analyses of proteid, 645.
Hukiewicz on measles and scarlatina, 244.
Hullen on pigmentary syphilid of neck, 444.
Humbert on heart-beat, 523.
Hunt on multiple sclerosis with dementia, 383.
Hunt and Dana on tuberculosis of spinal cord, 382.
Hunt and Fraenkel on neurofibroma of acoustic nerve, 389; tumors of pontomedullary cerebellar space, 395.
Hutchings and Wheeler on typhoid epidemic, 13.
Hutchinson (J.) on latent syphilis, 446; on leprosy, 66.
Hutchinson (R.) on poverty in hemoglobin in childhood, 268.
Hutchison, Weber, and MacLeod on Bence-Jones albumosuria, 207.
Hutinel and Delestre on treatment of hemorrhagic disease of newborn, 253.
Hybridization, 541.
Hydatid cyst of brain in child, 291; disease, 80; disease in Australia, 80; disease of lungs, 166; disease, sonorous booming of, 81; thrill, 81.
Hydrargyrum hermaphenylicum in syphilis, 452.
Hydrarthrosis, intermittent, 105.
Hydrocephalus, 399; lumbar puncture in, 399; syphilitic, 251.
Hydrochloric acid and pepsin, combination, 647; excessive amount, in gastric carcinoma, 180; in lupus, 451; producing glands of stomach disease of, gout from, 94.
Hydrocyanic acid from proteids, 645.
Hydrogen dioxide in dysentery, 192.
Hydrolytic products of salmin, 644.
Hydrothorax, right-sided, in cardiac disease, 134.
Hygiene, industrial, 600; municipal, 597; public, 579; school, 602.
Hymenolepis nana, 227.
Hynitsch on intestinal obstruction from gallstones, 195.
Hyoscin, 495; in gastric hypersecretion, 496; in morphinism, 495; in paralysis agitans, 495, 496; poisoning, 496.
Hyperacidity and hypersecretion, gastric, differentiation, 172; of gastric juice, 172.
Hyperalgesia, Head's zones of, in children, 286.
Hyperidrosis of feet, potassium permanganate in, 501; plantaris, formol in, 451.
Hyperpyrexia, rheumatic, 54.
Hypersecretion, alimentary, 172, 173; and hyperacidity, gastric, differentiation, 172; gastric, hyoscin in, 496.
Hypertonus, arterial, 152.
Hypertrophic osteoarthropathy, 104; osteoarthropathy, 406; osteoarthropathy, acute diseases in cause, 104; osteoarthropathy, toxic cause, 105.
Hypertrophy of heart, nephritic, cause, 213; of intestine, 194; of prostate, beginning, anatomic investigations on, 349.
Hypnotic, hedonal as, 495.
Hypnotism, 375.
Hypoglossal nerve, peripheral neuritis of, 393.
Hypoleukocytosis from albumose, 522; in typhoid fever, 23.
Hypophysis, tumor of, akromegaly and, anatomic relation, 344; without akromegaly, 406.
Hypostatic pneumonia in children, 263.
Hysteria, 409; in children, 286; in children, monosymptomatic form, 286; in neurotic children, 278.
Hysterical skin eruptions, 409.
ICE-BAG in acute visceral inflammations in children, 294.
Ichthargan, 496; in atrophic rhinitis, 496; in diseases of eye, 496; in gonorrhea, 496; in gonorrheal cystitis, 496; in gonorrheal urethritis, 496.
Ichthyol, 496; in mycosis fungoides, 496; in recurrent lymphangitis in filariasis, 78; in tuberculosis, 44, 496.
Icteric urine, Fehling's solution in, reduction of, 81.
Icterus, 197; and Grüber-Widal reaction, 331; catarrhal, epidemic of, 198; chronic, with hemorrhagic tendency involving bronchi, 165; epidemic, 198; menstrual, 198; pathogenesis, 358; peculiarities of bile-pigments in, 195; slowing of pulse in, cause of, 197; syphilitic, 198; Widal reaction in, 24.
Idiocy, surgery of, 422.
Illuminating gas, poisoning from, 568, 573.
Immune milk in prevention of tuberculosis, 232.
Immunity against agglutination of streptococci, 332.
Immunization against tuberculosis, 47; of animals with tubercle bacilli from tortoise, 47; with diphtheria antitoxin, 588.
Impetiginous eczema in children, nephritis after, 283.
Impetigo contagiosa in children, stomatitis in, 292; Klebs-Löffler bacillus in, 292.
India, medical jurisprudence in, 554; plague in, 62; typhoid fever in, 17.
Indican, excretion in diabetes, 636; in urine, 656.
Indigo-red in urine, 656.
Indol, 652; in feces, dimethylamidobenzaldehyde reaction of Ehrlich as test for, 185.
Indoxyl in blood, 628.
Industrial diseases, 600; hygiene, 600.
Ineyrat on syphilitic chancres, 445.
Infant, changes in body-weight of, relation between water and salts and, 233; mortality, 617; mortality in England, 618; mortality, milk and, 618; mortality, prevention, 617; nutritive requirements, 233; weight of, influence of sodium chloride on, 236.
Infant-feeding, 230; buttermilk in, 236; deficient proteids in, 233; milk elements in, idiosyncrasies for, 236; milk in, pure and impure, 234; nutrient sugar in, 235.
Infantilism due to defective pancreatic secretion, 276.

- Infaret, hemorrhagic, of lung, 165.
 Infection, generalized, with thrush, 256; influence on excretion of sugar, 86, 87.
 Infections of newborn, 252.
 Infectious chorea in children, arsenic in, 255; diseases, 11; acute, as cause of myxedema, 98; acute, disturbances of circulation in, 135; collargol in, 487; elastic tissue in liver in, 356; in children, 237; in Italy in 1903, 613; management and control, 580; prevention, in Italian schools, 605; in Russia in 1901 and 1902, mortality from, 614.
 Inflammation, glycogen in, significance, 323; of heart in children, opium in, 267.
 Influenza, 57; and appendicitis, 188; bacilli in tonsils and larynx, 304; resembling latent tuberculosis, 237; scarlatiniform rash in, 428; typhoid fever with, 18.
 Influenzal arthritis, 57.
 Ingalls on thiochol in pneumonia, 53.
 Inhalation-tuberculosis, 29, 33.
 Ink, bacteriology, 619.
 Inoscopy, Jousset's, 41; for examining exudates for tubercle bacilli, 27.
 Inouye on fat-splitting ferment of gastric juice, 170; on levulinic acid, 639.
 Insane monolog, 421.
 Insanity, adolescent, katatonic form, 419; alcoholism as cause, 558; in crime, 560; moral, medicolegal aspects, 553; railroad transporting persons with, medicolegal aspects, 552; surgery, 422.
 Insomnia, disturbance of circulation as cause, 133.
 Inspiratory fibers in vagus, 529.
 Insurance, recovery of, in suicide, 549.
 Intercostal muscles, superior, movements of, in hemiplegia, 395.
 Intermittent hydrarthrosis, 105; pulse, 524.
 Intestinal autointoxication in children, 259; disturbance, gynecologic conditions as cause, 186; hemorrhage in typhoid fever, 20; infection, primary, in tuberculosis, 28; obstruction, 195; obstruction from gall-stones, 195; paralysis, postoperative, physostigmin in, 500; parasites, 222; parasites, eosinophilia in those infected with, 222; tuberculosis in children, 249; tuberculosis, primary, 34; tuberculosis, primary, in children, 302; wall, passage of tubercle bacilli through, 296.
 Intestine, carcinoma of, 194; dilation of, 194; diseases of, 185; diseases of, bismutose in, 188; diseases of, gynecologic conditions as cause, 186; hypertrophy of, 194; movements of, effect of adrenalin on, 532; movements of, physiology, 531; syphilis of, 195.
 Intrabuccal field of anesthesia, boundary of, 387.
 Intracranial neurectomy for trigeminal neuralgia, 384.
 Intraneural injection of antitoxin in tetanus, 401.
 Intratracheal injections in asthma, 161.
 Intussusception, diagnosis of, for Henoch's purpura, 253.
 Iodid of potassium eruption simulating epithelioma, 435.
 Iodids, 496.
 Iodin, 497; distribution in body, 638; in chronic lymphadenitis, 497; in goiter, 497; in parathyroids, 638; in tuberculous peritonitis, 497; physiologic chemistry, 638; reaction in blood of children, 271.
 Iodin-content of thyroid, 638.
 Iodipin, 497; in syphilis, 497.
 Iodipin-injections in aortic aneurysm, 158.
 Iodism, 497, 570.
 Iodoform, 498; in tuberculosis, 45.
 Irish population, housing, 616.
 Iron, 498; action on bone-marrow of rabbits, 336; arc lamp, phototherapy with, 505; inorganic, physiologic chemistry, 638; physiologic chemistry, 638.
 Isaac and von den Velden on injection of bothrioccephalus substance producing a pre-cipitin, 228.
 Islands of gastric mucous membrane, 355.
 Italian and public health, 616; schools, prevention of infectious diseases in, 605.
 Italy, infectious diseases in, in 1903, 613.
 Itch, ground-, 225.
 Ithaca, typhoid fever in, 16.
 Iwanoff on nuclease, 641.
 JACOB (F. H.) on lupus vulgaris, 430; on röntgen rays in skin diseases, 508.
 Jacob (P.) on muscular rigidity of spinal column, 102.
 Jacob and Marshall on double tubercular granuloma, 291.
 Jacobson on pertussis, 246.
 Jacobson and Klein on Marmorek's serum, 482.
 Jacoby on sign of orbicularis in paralysis of seventh cranial nerve, 394.
 Jaquet on inoculations in alopecia areata, 429.
 Jaenicke on tea made from birch-leaves for renal calculi, 222.
 Jaja and Dee Narchis on silver fluorid in variola, 451.
 Jakuschewitsch on hemolysins in animals deprived of spleen, 328.
 Jamaica, leprosy in, 65.
 Jamieson on röntgen rays and Finsen light in lupus vulgaris, 454; on röntgen rays in mycosis fungoides, 455.
 Jancso and Veszprémi on periarthritis nodosa, 346.
 Janeway on hypertrophic osteoarthropathy, 104, 406.
 Januszkiewicz on acute leukemia, 120, 341.
 Japha (A.) on spasm of glottis in children, 286.
 Jassniger and Körnöczy on Jousset's inoscopy, 41.
 Jaundice, 197 (see also *Icterus*).
 Javal and Vidal on parenchymatous nephritis, 220.
 Jaw, lower, upper eyelid and, associated movements of, 374.
 Jellinek on aortic aneurysm, 157; on arterial stenosis, 158.
 Jemma on primary gangrene of throat in child, 256.
 Jensen on action of light on animals and man, 543.
 Jex-Blake and Rolleston on nutritive enemas, 178.
 Jez's antityphoid serum, 26.
 Joachim (G.) on blood in feces, 169.
 Jochman on Streptococcus scarlatinae, 239.
 Johnston on black, hairy tongue, 440.
 Joint-pains in gout, guaiac in, 95; sulfur in, 95.
 Jolles on detecting bile-pigments in urine, 656.
 Jonas on typhoid fever, 20.
 Jones on control of measles, 589.
 Jones on xanthin bases of nucleic acid, 625.
 Jones (F.) on syphilis in negro, 445.
 Jones (E. L.) on tuberculosis, 36.
 Jones (H. E.) on acute dermatitis, 436.
 Jones (R.) on antistreptococcus serum in puerperal sepsis, 479.
 Jones (S. S.) on syphilis, 448.
 Jones and Partridge on guanase, 626.
 Jong on papillary cancer of renal pelvis, 354; on splenic leukemia, 342.
 Joseph on bromocoll in lichen urticatus and eczema in children, 292.
 Josias on antityphoid serum, 482.
 Josias and Roux on tuberculosis in children, 250.
 Joslyn on influence of various fats on formation and excretion of acetone, 354.
 Jousset and Brailon on tuberculous endocarditis, 39.
 Jousset's inoscopy, 41; for examining exudates for tubercle bacilli, 27.
 Jowett on veratric acid by oxidation of methylated adrenalin, 649.
 Judgments awarded, 554.
 Judicial determination of cause of death, 548.
 Judson on chorea minor in child, 254.
 Jugular veins, thrombosis of, 159.
 Jullien and Berlioz on mercurial cacodylate in syphilis, 453.
 Jumon on radium, 467, 503.

- Jundell on percussion of apexes of lungs in tuberculosis, 36.
 Jürgens on dysentery in Berlin, 190.
 Jurisprudence, medical, 550; in India, 554.
 Justus on distribution of iodine in body, 638; on hemoglobin test for syphilis, 447.
- KAHN (F.) on disinfectants of bile-passages, 202.
 Kahn (R. H.) on effect of suprarenal extract, 537; on retinal bloodvessels, 528; on swallowing, 530.
 Kala-azar, Leishman-Donovan bodies in, 316.
 Kalteyer and Wilson on sarcomatosis cutis, 432.
 Kanda on comparisons of tuberculin of human and bovine tubercle bacilli in diagnosis of bovine tuberculosis, 300.
 Kaplan and Bullowa on adrenalin in asthma, 161, 474.
 Kapsammer on epidural injections in enuresis, 281, 370.
 Karrenstein on effect of body-work on blood-pressure, 152.
 Kassabian on röntgen rays, 509.
 Kast on blood-conditions in Banti's disease, 125.
 Kast and Gütig on hypoleukoecytosis in typhoid fever, 23.
 Kastle on lipase, 633.
 Kastle and Loevenhart on action of inhibitors and accelerators on catalysis of hydrogen dioxid by metals, 634.
 Kastle and McCaw on ferment in liver, 633.
 Katatonic form of adolescent insanity, 419; manifestations, prognosis, 420.
 Katz and Witthauer on styptol, 513.
 Kaufmann and Schlesinger on Oppler-Boas bacilli in gastric contents, 183.
 Kayser on mesotan, 499.
 Keen on radium in carcinoma, 504.
 Keleman (G.) on helmitol in cystitis, 495.
 Kellermann on light therapy in skin diseases, 463.
 Keloid, röntgen rays in, 454.
 Kelynaack and Williams on oral and rectal temperatures in tuberculosis, 36, 37.
 Kemp on transilluminating stomach, 169.
 Kennard on salicylic acid and quinin in malaria, 70.
 Ker on diphtheria, 242.
 Kerley, Gieschen, and Myers on acidity of cow's and human milk, 231.
 Kétly and Forday on cytodagnosis in pleural and peritoneal effusions, 42.
 Kidd on Adams-Stokes disease, 142.
 Kidney, movable, 218 (see also *Movable kidney*).
 Kidneys, action of cantharidin on, 351; action of diphtheria toxin on, 351; action of mercuric chlorid on, 351; action of, relation between action of skin and, 219; antihemolysins and, relation, 627; calculus in, 218; calculus in, tea made of birch-leaves for dissolving, 222; calculus in, treatment, 221; cystic, 353; development of, disturbances in, 350, 353; diseases of, 203; diseases of, treatment, 219; effect of borated food on, 640; excretion of bacteria through, action of diuretic substances on, 354; freezing-point of, determination, 324; gangrene, of 219; granular, gout and, relation, 93; influence of agurin upon, 221; influence of diuretin on, 221; insufficiency of, increase in osmotic pressure of blood as indication, 111; methods of examination, 203; necrosis of, in child, after pneumonia, 283; of rabbits, changes in, after lesions of papillas, 350; papillas of, ulcerating tuberculosis of, hematuria from, 39; secretion of acid by, 539; unilateral, extirpation of, changes in gastric secretion after, 170; unilateral lesions of, methods of diagnosing, 217.
 Kiliani on tumors of chiasm, 397.
 Kilner on osteitis deformans in brother and sister, 103.
 Kimball on gonorrheal pyemia in infants, 285.
 King on röntgen rays in bronchiectasis, 162.
 King and Ashford on uncinariasis in Porto Rico, 226.
 Kingdon on potassium iodid in thoracic aneurysm, 158, 496.
 Kinghorn, Trudeau, and Baldwin on tuberculin reaction, 298.
 Kinsey on blood-cultures in pneumonia, 52.
 Kirsch on Cambier's method of isolating typhoid bacilli, 25.
 Kiste and Trautmann on Esmarch's method of disinfection with formaldehyd, 596.
 Kister and Matthes on disinfection of dwellings, 594.
 Kitschmann on atrophic hepatic cirrhosis, 199.
 Kittel on aristochin in whooping-cough, 483.
 Kjeldahl method of determining nitrogen, 638.
 Klapp on effect of adrenalin on absorption, 472.
 Klebs on pneumonia, 48.
 Klein on lymphatic leukemia and lymphomatosis, 112.
 Klein and Jacobson on Marmorek's serum, 482.
 Klemperer on renal calculus, 221.
 Klotz on reinfection of syphilis, 444.
 Knapp (P. C.) on bone sensibility, 364.
 Knecht on sodium salicylate in rheumatism, 511.
 Knee-jerk reflex, 367.
 Knöpfelmacher on assimilation-limit for sugar, 637.
 Kober on transmission of bovine tuberculosis, 248.
 Koch on camphor in tuberculosis, 44; on chemie analysis of brain and cord, 628; on malaria, 588.
 Kochmann on effect of prolonged feeding with meat, 93.
 Koch's lymph in lupus, 431; quinin prophylaxis in malaria, 69.
 Koeltzer on air exhaled by consumptives, 584.
 Koepppe on laking of blood by ether, 520.
 Koepppe and Hamburger on reaction of blood, 522.
 Kohler on treatment of tropical dysentery, 193.
 Kolbe and Gotschlich on cholera, 62.
 Kölzer on expired air in tuberculosis, 33.
 Koplik on epidemic cerebrospinal meningitis, 288; on vulvovaginitis in children, 284.
 Koplik's spots in measles, 245.
 Korff on scopolamin-morphin narcosis, 511.
 Körnőczy and Jassniger on Jousset's inoscopy, 41.
 Korowicki on blood in rheumatism, 54.
 Körte and Stern on typhoid reaction, 24.
 Kossel and Dakin on arginase, 622, 624; on hydrolytic products of salmin, 644; on protamins, 644.
 Kramer on theocin, 514.
 Kraus (F.) on diet of cardiac cases in relation to hydremia and dropsy, 150; on sugar-formation in liver, 535.
 Kraus on euquinin in whooping-cough, 493.
 Krause (K. A.) on urate-deposits in gout, 92.
 Krause and Hartog on posttyphoid thyroiditis, 21.
 Krause's Beobachtung, 387.
 Krauss (F.) on poisoning from hyoscin hydrobromid, 496.
 Krauss (W.) on typhoid fever, 22.
 Krebs on influence of local cold on cardiac action, 149.
 Kredel on dilation and hypertrophy of intestine, 194; on embolism of leg after pneumonia, 51.
 Kremers on gangrene from carbolic acid, 486.
 Krogus on röntgen rays in sarcoma, 507.
 Krolliek on effects of excessive employment out of school-hours, 602.
 Kromayer on phototherapy with iron arc lamp, 505.
 Kronecker on mountain sickness, 528.
 Krotoszyner and Willard on lesions of kidney, 216, 217.
 Krüger and Reich on ammonia in urine, 656.
 Kühn on croupous pneumonia, 264.
 Kuliabko on resuscitation of isolated hearts, 525.
 Kuliabko and Alexandrowitsch on movements of intestine, 532.
 Kurdiowski on isolated uterus, 541.

- Kurpjuweit on spleen in pernicious anemia, 115.
 Kurtz on amebic dysentery, 192.
 Kutscher and Lohmann on pancreatic digestion, 630.
 Kutscher and Seemann on oxidized nucleic acid, 641.
 Kyphoscoliosis, hourglass deformity of stomach from, 176.
- L'ENGLE and Price on oil of gaultheria poisoning in child, 294.
 Labbé on cryoscopy in scarlatina and diphtheria, 240; on empyema in children, 265.
 Labbé and Demarque on Klebs-Löffler bacillus in impetigo and ecthyma, 292.
 Labbé and Lortot-Jacob on iodine, 497.
 Lace collar, 444.
 Lacrimal glands, symmetric diseases of, 345.
 Lactagol, 498; for increasing mammary secretion, 230; to increase secretion of milk, 498.
 Lactic acid fermentation, 84; in pruritus in children, 442.
 Lactic-acid-producing bacilli in gastric contents, 183.
 Lactose of milk, formation, 640.
 Lactoserum and caseoserum, human and cow's, precipitin reaction, 641.
 Lafay on hypodermatic medication in syphilis, 449.
 Laffeur on gastric syphilis, 185.
 Lagrain and Guiard on lumbar puncture, 221.
 Laking of blood by ether, 520.
 Lambert on N-rays, 646.
 Lambert (A.) on cramp in muscles in amebic dysentery, 192.
 Lamp, phototherapeutic, 461.
 Lamy and Terrien on displacement of heart's apex in children, 267.
 Lancereaux on gelatin in aneurysms, 494.
 Landau on nitrogen in urine, 654.
 Landau (A.) on cholemia, 337; on osmotic pressure of blood, 111; on renal insufficiency in arteriosclerosis, 155.
 Landau (T.) on spleen pulp, 512; on stagnin, 519.
 Landau and Hirsch on stagnin, 626.
 Landenheimer on veronal, 516.
 Landouzy's typhobacillosis, 249.
 Landsberg on alimentary levulose, 196.
 Lang on influence of food-stuffs on secretion of gastric juice, 177, 531.
 Langer and Ganghofner on biologic test for detecting albumin, 646.
 Langley and Anderson on regeneration of nerve-fibers, 540.
 Langstein and Mayer on homogentisic acid in urine, 623; on proteids of blood-plasma, 627.
 Langstein and Meerwein on Widal reaction in icterus, 24.
 Langstein and Meyer on alkaptonuria, 206.
 Lapin on bronchiectasis in children, 262.
 Larva migrans, 441.
 Laryngeal crepitation in phthisis, 41; nerve, recurrent, paralysis of, in mitral stenosis, 145; stridor, congenital, in children, 273.
 Larynx, bacillus of influenza in, 304; edema of, in children, 262; swelling of, from acute transitory edema, 106.
 Laslett on nature of Curschmann's spirals, 161.
 Lassalle and Dickson on varioloid varicella, 56.
 Lassar on tuberculous infection among slaughterhouse workmen, 602.
 Lassar (O.) on radium in inoperable cancer, 503; on röntgen rays in eczema, 507.
 Lasserre and Guiraud on lowering freezing-point of milk, 640.
 Laughter, effect on cardiac disease, 136; sphygmogram taken during, 136.
 Lavenson and Edsall on chronic polyarthritis, 99.
 Laveran on arsenous acid in sleeping-sickness, 483; on prophylaxis of malaria, 69.
 Lawrence on parietic dementia, 418.
 Laws, state, regarding practice of medicine, 560-564.
- Layton on serum from rabbits, 574.
 Lazarus on aortic aneurysm, 158.
 Le Gendre on tuberculosis among school-teachers, 606.
 Leach and Lythgoe on standard of cider vinegar, 609.
 Lead, action on bone-marrow of rabbits, 336; and antimonial poisoning from use of linotype, 435; poisoning from wall-paper, 619; poisoning in house painters, 601; poisoning in white-lead factories, 601.
 Leaf on excision of lupus, 431.
 Leathes and Hildersheim on synthesis of higher fatty acids in liver, 632.
 Lecithin content of fatty extracts, 632; effect of radium rays, on, 542.
 Leegal on hydrargyrum hermaphenylicum in syphilis, 452.
 Lees (D. B.) on chorea in childhood, 254; on ice-bag in acute visceral inflammations in children, 294; on sodium salicylate in chorea, 511.
 Lefour on lead poisoning from wall-paper, 619.
 Leg, embolism of, after pneumonia, 51; scalding of, damages for, 555.
 Legal decisions on medical subjects, 554; medicine, 545.
 Legois on typhoid fever, 20.
 Lehdorff on radiography in diagnosing infantile scurvy, 279.
 Leigten and Miralée on uncontrollable vomiting in child, 272.
 Leishman-Donovan bodies, 315, 316; in cachectical fevers, 316; kala-azar, 316; disease, 76.
 Leiter and de Stoutz on diphtheria, 585.
 Lemaire and Bourneville on rachitic feeble-mindedness, 278, 279.
 Lemoine on hypodermatic medication in syphilis, 449.
 Lemon-juice, effect on typhoid-polluted water, 592.
 Lendon on hydatid disease, 80.
 Lengemann on thiosinamin, 514.
 Lenzmann on Talma's operation in atrophic cirrhosis, 199.
 Lepine on serum for Graves' disease, 402.
 Lépine and Boulud on röntgen rays, 505, 646.
 Leprosy, 65; fish in cause of, 66; in Hawaiian Islands, 66; in Jamaica, 65; mercuric bichlorid in, 450; mercury chlorid in, 498; mercury perchlorid in, 66.
 Leptomeningitis, serous, acute, in children, 290.
 Lerch on malaria followed by neuritis, 68.
 Leredde and Pautrier on Finsen light in lupus vulgaris, 471.
 Leri on retina in tabes, 379.
 Leroux and Lorrain on diplococci infection in typhoid fever, 303.
 Lesser on aneurysm in tabes, 380; on iodism, 497, 570; on regeneration of proteid, 639.
 Leszynski on brain-tumor, 397.
 Letulle on Calmette treatment of wounds, 513.
 Leuchs and Fischer on glucosamin, 635.
 Leucin in synthesis of sugar, 636.
 Leukanemia, 118.
 Leukemia, 118; acute, 120, 340, 341; acute, etiology, 120; acute, leukocytosis in, 113; acute myelogenous, 121; acute, rupture of spleen as cause of death in, 120, 121; acute, septic endocarditis and, differentiation, 114; chronic lymphatic, 121; chronic mixed, 122; chronic mixed, metabolism in, 122; influence of complicating diseases upon, 119; lienal, 122; lienal, spleen in, 122; lymphatic, 112; lymphatic, bone-tenderness in, 119; lymphatic, chronic, 121; lymphatic, in children, 269; lymphatic, leukemic changes in nose in, 122; lymphatic, pneumonia in, 122; lymphatic, with purpura, 440; mixed, chronic, 122; mixed, chronic, metabolism in, 122; myelogenous, acute, 121; myelogenous, in children, 269; myelogenous, splenic anemia and, relation, 124; of infants, 270; röntgen rays in, 124, 506, 510; splenic, in young calf, 342; splenomedullary röntgen rays in, 123; splenomyelogenous, 121; tuberculosis and, 119.

- Leukemias and pseudoleukemias, scheme for classification, 341.
- Leukemic blood, peptic and tryptic ferments in, 628.
- Leukocyte-counts, differential, in counting chamber, stain for, 339; differential, in parasitic infections, 223; in diseases of vermiform appendix, 189; in typhoid fever, 23.
- Leukocytes, 114; glycogen reaction, 115; glycolytic ferment and, 85; granulations of, 114; in diphtheria, 243, 244; in pleurisy, 163; number of, in children, 268; reaction in variola, 314; relationship of, to bacteriolytic power of blood, 327; variability, 335.
- Leukocytosis in abscess of liver, 200; in acute leukemia, 113; of variola, 56.
- Leukoderma in children, 293.
- Leukokeratosis buccalis, histologic changes of, compared with tylosis palmae et plantae, 438.
- Leukonychia striata arsenicalis transversus, 434.
- Levene on self-digestion of pancreas, 625.
- Levene and Stookey on proteolytic power of combined gland extracts, 630.
- Levison on formaldehyd poisoning, 571; on formalin poisoning, 493.
- Levulinic acid, 639.
- Levulose and dextrose in urine, coincident appearance, 82.
- Levulosuria, 82; alimentary, in disease of liver, 196.
- Levuretin in diabetes, 91.
- Levy on vaccination and lymph, 314.
- Lewandowsky and Schultz on nerves of ureter and bladder, 539.
- Lewis (H. W.) on mental state in myxedema, 403.
- Lewis (P.) on enuresis in children, 281.
- Lichen planus, atrophic, 428; scrofulosorum in children, 293; urticatus in children, bromocoll in, 292.
- Lichtenstein on pruritus, 442.
- Lichty on splenic anemia, 124.
- Liefmann on etiology of hay-fever, 317.
- Liepert on mesotan in rheumatism, 499; on scopolamin, 511.
- Life, loss of, in 1903, 617.
- Light, red, in variola, 57; therapy in skin diseases, 463.
- Lightning, effect of, 548.
- Lime-dust in tuberculosis, 46.
- Lincoln on transillumination of stomach, 169.
- Linear albicantes on knees of convalescent from typhoid fever, 279.
- Linossier on influence of sodium chlorid of food on gastric juice, 647.
- Linser and Baermann on röntgen rays, 506.
- Linser and Schmid on increased proteid decomposition, 634.
- Lion on coincident appearance of levulose and dextrose in urine, 82; on tendon-reflexes in nephritis, 214; on Widal reaction, 331.
- Lion and Gilbert on experimental arterial atheroma, 345.
- Lipase, physiologic chemistry, 633.
- Lipemia in diabetes, 88, 89, 633.
- Litchfield on diphtheric erythema intertrigo, 292.
- Lithiasis, renal, in children, 283.
- Little on tuberculin in lupus vulgaris, 431.
- Liver, abscess of, 200; abscess of, leukocytosis in, 200; acute yellow atrophy of, 198; acute yellow atrophy of, aminoacids in, 623; acute yellow atrophy of, free aminoacids in blood in, 198; angiosarcoma of, primary multiple alveolar, in child, 321; autolysis of, effects of extracts of thyroid, kidney, and spleen on, 626; autolytic ferments of, 626; carcinoma of, 360; changes in position, in meteorism, 185; cirrhosis of, 199; cirrhosis of, atrophic, Talma's operation in, indications, 199; cirrhosis of, atrophic, venous pulse in veins of forearms in, 199; cirrhosis of, in children, 257; cirrhosis of, reaction to ferric chlorid in, 199; congested, chronically, 358; diseases of, 195; diseases of, alimentary levulosuria in, 196; elastic tissue in, in infectious diseases, 356; fatty, fatal effects of chloroform on children with, 257; ferment in, capable of hydrolyzing potassium myronate, 633; floating, 201; necrosis of, zonal, 359; pathology of, comparative studies in, 359; red atrophy of, 358; sugar-formation in, 535; synthesis of higher fatty acids in, 632; syphilis of, 200; syphilis of, ascites from, 200; zonal necrosis of, 359.
- Liver-cells, adenoma of, 360; carcinoma of, 360; toxin from, 650.
- Livingston on ergot in typhoid fever, 26.
- Locomotor ataxia, aneurysm in, 380; crises of fever in, 377; diagnosis, 380; feculent vomiting in, 172; gastric crises in, 171; in negro, 377; Obersteiner-Redlich theory of, 378; prostatic crises in, 379, 380; retina in, 379; sodium cinnamate in, 379; syphilis and, relation, 133; syphilis in, 379; traumatic cause, 378; valvular heart disease and, relation, 133.
- Loeb (J.) on fertilizing eggs of sea-urchin, 541.
- Loeb (L.) on blood-corpuscles in coagulation of blood, 338; on coagulation of blood, 518; on influence of bacteria on coagulation of blood, 338.
- Loeb (O.) on digitalis, 490; on effect of chloroform on heart, 487.
- Loebe (F.) on dyspeptine, 179.
- Loebl on collargol, 488; on collargol in sepsis, 59.
- Loebl on Credé's silver in sepsis, 59.
- Loeper and Crouzon on action of adrenalin on blood, 336; on edema in hemiplegia, 396.
- Loevenhart on casein, 628.
- Loevenhart and Kastle on action of inhibitors and accelerators on catalysis of hydrogen dioxid by metals, 634.
- Loewenthal on primary basal tuberculosis, 38.
- Loewi on influence of clysters on peristalsis, 178.
- Lohmann and Kutscher on pancreatic digestion, 630.
- Lohrlich on absorption in chronic habitual constipation, 188.
- Lombroso on absorption of fat, 633.
- Lommel (F.) on albuminuria, 209; on influence of sweating on viscosity of blood, 519.
- London on effect of radium, 502, 542.
- London and Goldberg on radium, 467.
- London school boys and girls, physical development, 603; typhoid fever in, 12.
- Long on relation of electric conductivity of urine to its chemic composition, 655.
- Long on sewage-farm produce, 607.
- Lorand on relation of pancreas and thyroid, 631; on children of diabetic persons, 271.
- Lorrain and Leroux on diplocoecic infection in typhoid fever, 303.
- Lortot-Jacob and Labbé on iodine, 497.
- Loss of life in 1903, 617.
- Low on smallpox isolation in Germany, 590.
- Low and Mott on sleeping-sickness, 373.
- Lowe and Manson on Leishman-Donovan disease, 76.
- Lowenburg on hydrocephalus, 399.
- Lowenthal on health of European armies, 614.
- Lubbert on hemoglobinuria, 68.
- Lubbert and Prausnitz on Dunbar's antitoxin, 494.
- Lublinski on acute thyroiditis in acute throat-inflammations, 167.
- Lubowski and Steinberg on agglutination of typhoid bacilli, 331.
- Luce (F. W.) on acetanilid poisoning, 571.
- Luce (H.) on leukanemia, 118.
- Lumbar puncture, 374; in acute uremia, 221; in cerebellar tumor in child, 291; in headache in chronic nephritis, 221; in hydrocephalus, 399.
- Lund, Bruce, and Whitcombe on myelopathic albumosuria, 208.
- Lundborg on progressive myoclonus epilepsy, 415.
- Lungs, abscess of, in children, 266; affections of, 164; cysts of, congenital, in children, 266; edema of, acute suffocative, 164; emphysema of, 161; emphysema of, etiology, 161; hemorrhagic infarct of, 165; hydatid disease

- of, 166; multiple abscess of, in children, 266; percussion of apex of, in tuberculosis, 36; syphilis of, 166; tissue, aberrant, tumor of pleura from, 320; vasomotors of, 526.
- Lupus and tuberculosis, 35; concentrated sun's rays in, 462; erythematous, actinotherapy in, 460; ethyl chlorid in, 492; excision of, 431; Finsen light in, 470, 471; high-frequency sparks in treatment of, 464; hydrochloric acid in, 451; Koch's lymph in, 431; multiple, 431; radium in, 503; sodium salicylate in, 451; uranium nitrate in, 503; verrucosus, radium in, 468; vulgaris, 430; vulgaris, Finsen light in, 454; vulgaris, radium in, 468; vulgaris, röntgen rays in, 454.
- Luschka's sacral gland in childhood, perithelioma of, 321.
- Lusk on inversion of cane-sugar in stomach, 631.
- Lusk and Mandel on ratio of dextrose to nitrogen in urine in diabetes mellitus, 636.
- Lutein in suppressed menstruation, 537.
- Lüthje on power of destroying sugar after extirpation of pancreas, 86; on sugar formed from proteid, 636.
- Lymph, Koch's, in lupus, 431; vaccination and, 314.
- Lymphadenitis, chronic, iodine in, 497; in children, 274.
- Lymphangioma of tongue in child, 255.
- Lymphangitis, filariasis and, 77; recurrent in filariasis, ichthyol in, 78.
- Lymphatic glands, enlarged, in sleeping-sickness, 75; glands in sleeping-sickness, 75, 316, 374; glands in trypanosomiasis, 75; leukemia, 112; leukemia, bone-tenderness in, 119; leukemia, chronic, 121; leukemia in children, 269; leukemic changes in nose in, 122; pneumonia in, 122; with purpura, 440; vessels and glands connected with esophagus, 167.
- Lymphemia, lymphocytes in, 119.
- Lymph-glands, abdominal, syphilis of, 200; in typhoid fever, 14.
- Lymphocytes in diarrhea of children, 260; in lymphemia, 119.
- Lymphomatosis, 112.
- Lyon (E. P.) on rheotropism, 541.
- Lyon (G.) on action of diphtheria toxin, mercuric chlorid, and cantharidin on kidney and spleen, 351.
- Lyon and Wherry on infectious dermatitis in chronic morphinism, 436.
- Lysoform, 498.
- Lysof in cerebrospinal meningitis, 393; injection of, into spinal canal, in cerebrospinal meningitis, 289.
- Lythgoe and Leach on standard of cider vinegar, 609.
- MACADAM (H. G.) on purpura hæmorrhagica fulminans, 253.
- Macaroni, good, characteristics, 611.
- MacCallum (J. B.) on saline purges, 510.
- MacCallum (W. G.) on parathyroid gland, 406; on thyroid and parathyroid cytolytic serum, 96.
- MacConkey and Macfadyean on tubercle bacilli, 30.
- MacDougall on morphin, 499.
- Macfayden and MacConkey on tubercle bacilli, 30, 247.
- MacIntyre on Finsen light, 470; on radium, 467; on röntgen rays, 510.
- MacIntyre on intracellular toxin in *Bacillus pyocyaneus*, 650.
- MacKenzie (A. D.) on parasitic hemoptysis, 165.
- MacKenzie (J.) on antistreptococcus serum in puerperal sepsis, 479; on disturbance of conductivity of heart, 137; on irregularity of heart, 136.
- MacKenzie (J. J.) on diphtheria, 243.
- Mackie on antistreptococcus serum in scarlet fever, 240, 479.
- MacLeod on radium and thorium, 468; on radium in lupus, 468.
- MacLeod and Bulloch on chemistry of tubercle bacillus, 651.
- MacLeod and Fox on Paget's disease of umbilicus, 433.
- MacLeod and Hill on caisson disease, 529, 602.
- MacLeod, Weber, and Hutchinson on Bence-Jones albumosuria, 207.
- MacMurchy on school inspection, 603.
- Madagascar, malaria in, prophylaxis, 69.
- Madsen and Arrhenius on diphtheria and other toxins, 649, 650.
- Magnesium salts in multiple warts, 433.
- Magnus on movements of intestine, 531.
- Magnus-Alsleben on adenomyoma of pylorus, 357.
- Magnus and Gottlieb on digitalis, 490.
- Magnus-Levy on cachexia strumipriva, 98; on cretinism, 98; on myxedema, 98.
- Magrath and Brinkerhoff on Cytoryctes variolæ in skin of monkey inoculated with variolavirus, 312; on experimental variola in monkey, 310; on infectiousness of blood in variola, 313.
- Magrath, Brinkerhoff, and Bancroft on leukocyte reaction in variola, 314.
- Magrath, Councilman, and Brinkerhoff on variola, 309.
- Maguire on acute contagious pemphigus in newborn, 429.
- Mainwaring on effect of calcium chlorid on hemolysis, 521.
- Malakoplakia of bladder, 349.
- Malaria, 68; and uncinariasis, relation, 226; conflict with, 588; euquinin in prophylaxis, 493; etiology, 68; followed by neuritis, 68; in Ceylon, prophylaxis, 69; in Madagascar, prophylaxis, 69; Koch's quinin prophylaxis in, 69; mode of entry of spore into red corpuscle in, 68; quinin in, 70; salicylic acid and quinin in, 70; symptomatology, 68; treatment, 70; prophylaxis, 69.
- Malarial dysentery, 193.
- Malignant disease, blood in, 111; endocarditis, apyretic form, 144; endocarditis with meningitis, 144; growths, concentrated sun's rays in, 462; growths, degenerated, atolysis in, 653; growths, high-frequency sparks in, 464.
- Malingery, medical, 576.
- Mallet on immunized antiserum for identifying blood-stains, 573.
- Mallory on protozoan-like bodies in scarlet fever, 315.
- Mallory's Cyclaster scarlatinalis in scarlet fever, 315.
- Malpractice, 564.
- Malt liquor as cause of gout among poor, 95.
- Malta fever, 64; in Texas, 64.
- Maltose, converting of starch into, by saliva, 631.
- Mammack on iodid in aneurysm, 497.
- Mammalian heart, possibility of restoration, after somatic death, 523.
- Mammary secretion, increasing, 230; secretion, increasing, cow's udder for, 230; secretion, increasing, lactagol for, 230; secretion, increasing, thyroid gland for, 230; secretion, quality, 230, 231; tuberculosis, 297.
- Mancardi on suprarenal extract in atony of stomach, 474.
- Mandel on excretion of alloxuric bases, 654.
- Mandel and Lusk on ratio of dextrose to nitrogen in urine in diabetes mellitus, 636.
- Mangelsdorf on distention of stomach before migraine and epilepsy attacks, 416; on enlargement of stomach in migraine, 175.
- Manges on cerebrospinal meningitis, 289, 393.
- Mania, motor symptoms, 417.
- Manson on *Filaria nocturna* and diurna, 77; on filariasis, 77; on Malta fever, 65; on sleeping-sickness, 74; on trypanosomiasis, 72.
- Manson and Lowe on Leishman-Donovan bodies, 76, 316.
- Maragliano on antituberculous serum, 481; on treatment of tuberculosis, 46.
- Marantic children, relation of proteids to edema in, 276.

- Marasmus, arsenite of copper in, 276.
 Marchiafava and Bignami on disease of corpus callosum, 398.
 Marcus on parietic dementia, 418; on psychoses of pernicious anemia, 365.
 Marfan on diphtheria, 242.
 Marion on nerve-cells of brain in chorea, 399, 400.
 Maritime law entitles seamen to medical care, 551.
 Mark on spinal subarachnoid cocainization, 487.
 Markwald on dysentery, 191.
 Marmorek's serum in tuberculosis, 46, 482.
 Marriage, necessities of husband to wife in, 551.
 Marring of personal appearance, medicolegal aspects, 552.
 Marsh (J.) on diphtheria antitoxin, 480.
 Marsh (J. P.) on röntgen rays in mycosis fungoides, 455.
 Marshall on venom of rattlesnake, 651.
 Marshall (D. G.) on typhoid fever, 26.
 Marshall and Jacob on double tubercular granuloma, 291.
 Martin on reactions of heart-muscle to salts, 523, 524.
 Martin and Fry on examination of urine from infants, 280.
 Martin and Pennington on adrenalin, 474.
 Martinet on family diabetes, 88.
 Marx and Ehrenrooth on agglutination test for blood, 627.
 Marzagalli and Figari on antituberculosis serum, 481.
 Martzinovski on potassium permanganate in erysipelas, 501.
 Mask, black, of face, 439.
 Mason (C. F.) on bacillary dysentery in soldiers, 193; on dysentery, 192; on Malta fever in Texas, 64.
 Massage in gastrointestinal troubles, 177; of heart, 349.
 Mast-cells, hematogenous origin, 115.
 Master furnishing medical or surgical treatment for servants, medicolegal aspects, 551.
 Masturbation as cause of enuresis in children, 281.
 Materia medica, 469.
 Mathews (A. P.) on physiologic action of elements, 541.
 Matthes on autolytic ferments of liver, 626.
 Matthes on sanitary aspects of earth-burial, 598.
 Matthes and Kister on disinfection of dwellings, 594.
 Mattheson on housing of Irish population, 616.
 Matthew and Elder on pernicious anemia following parturition, 117.
 Mavrakis on fat-formation, 536, 632.
 May (O.) on pancreatic juice, 533.
 May (W. P.) on innervation of stomach, 531.
 Mayer on malpractice, 564.
 Mayer and Bierry on condition analogous to alimentary glycosuria, 627.
 Mayer and Henri on action of radium on col-loids, 646.
 Mayer and Langstein on homogentisic acid in urine, 623; on proteids of blood-plasma, 627.
 McAldowie on human plantar reflex, 369.
 McCaskey on chronic gastritis, 173; on combined pyloric carcinoma and phlegmonous gastritis, 181.
 McCassy on dangers of overstudy in children, 285.
 McCaw on paroxysmal hemoglobinuria in child, 280.
 McCaw and Kastle on ferment in liver, 633.
 McCollom and Blake on peritonitis in scarlatina, 239.
 McConkey and Macfayden on tubercle bacilli, 30, 247.
 McConnel and McFarland on xanthoma, 321.
 McCrae on arthritis deformans, 101.
 McCrae (J.) on typhoid fever, 15, 25.
 McCrae, Fyshe, and Ainley on lobar pneumonia, 49.
 McDowell on typhoid fever, 18.
 McFarland and McConnel on xanthoma, 321.
 McGraw and Hall on chronic cyanosis with polycythemia and enlarged spleen, 127.
 McGregor and Munro on polyarthritis with hemorrhages, 105.
 McGuigan on physiologic action of elements, 541.
 McKay on remittent fever in children, 281.
 McKendrick and Colquhoun on N-rays, 647.
 McLaughlin on ferrous sulphate as antiseptic, 594.
 McLeod on radium in lupus verrucosus, 468.
 McMurray on rodent ulcer on arm, 433.
 McVail on lumbar puncture in acute uremia, 221.
 Mycosis fungoides, 431.
 Measles and scarlatina, combined infection, 244; aphasia in, 245; bronchiectasis following, 263; control of, 589; epidemic of, 245; guaiacol carbonate in, 245; Koplik's spots in, 245; relapses in, 245.
 Meat, minced, in treatment of sprue, 187, 188; raw, in tuberculosis in children, 250.
 Meat-autointoxication, appendicitis from, 188.
 Meat-diet, chronic acid-intoxication from, 93; effect of, 93.
 Mediastinopericarditis, 143.
 Medical attendance, providing of, medicolegal aspects, 553; communications, privileged, 577; communications, privileged, French attitude toward, 576; inspection of schools, 603, 605; jurisprudence, 550; in India, 554; subjects, legal decisions on, 554.
 Medicine, preventive, 579.
 Mediterranean fever, duration, 65.
 Meerwein and Langstein on Widal reaction in icterus, 24.
 Megacolon, congenital, in children, 274.
 Megaloblasts, significance, 337.
 Megalocytes, significance, 337.
 Melancholia, motor symptoms, 417.
 Melanoderma in splenic anemia, 124.
 Mellin on bacteriuria in childhood, 280.
 Melot on syphilis insontium, 447.
 Meltzer (S. J. and C.) on effect of adrenalin on eye, 538.
 Meltzer and Salant on antihemolysin, 627; on blood-serum after nephrectomy, 521; on coagulation of blood, 628.
 Membrane, mucous, gastric, islands of, 355.
 Membranous diphtheria, 241; stomatitis, recurring, with erythema exudativum multiforme, 428.
 Mendel and Osborne on poison of ricin, 651.
 Mendel and Thacher on strontium, 512, 648.
 Mendel and White on allantoin, 654.
 Ménjère's disease, quinin in, 501.
 Meninges, cerebral, diseases of, 384; spinal, diseases of, 375.
 Meningitis, basilar, rhythmic, dilation and contraction of pupil in, 390; cerebrospinal, 57, 373 (see also *Cerebrospinal meningitis*); in parotitis, 290; malignant endocarditis with, 144; serous, in children, 290; tuberculous, 389.
 Meningoencephalitis, 290.
 Mensi on renal affections in nurslings, 283; on thymus glands in fetuses, 273.
 Menstrual icterus, 198.
 Menstruation, suppressed, lutein in, 537.
 Mental condition in epilepsy, 413; conditions, medicolegal aspects, 546; development, abnormal, rickets as cause, 278; diseases, 417; disturbance in myxedema, 98; state in myxedema, 403.
 Menzel on lymphatic leukemia, 122.
 Menzer on antistreptococcus serum, 478; on antistreptococcus serum in acute rheumatism, 480; on antistreptococcus serum in tuberculosis, 497.
 Mercier on empyema in children, 265.
 Mercurial cacodylate in syphilis, 453; exanthema, 437.
 Mercurials in skin diseases, 452.
 Mercure bichlorid in leprosy, 450; chlorid, action on kidney and spleen, 351.
 Mercuriot in syphilis, 452.
 Mercuro-Crème in syphilis, 452.
 Mercury, action on bone-marrow of rabbits, 336; biniodid, 498; biniodid in aborting acute tonsillitis, 498; biniodid in hereditary

- syphilis in child, 251; chlorid, 498; chlorid in leprosy, 498; cyanid, 499; injections in syphilis, gangrene from, 450; perchlorid in leprosy, 66; poisoning, 565; salicylate poisoning, 566.
- Merkel on chronic gastric ulcer, 357.
- Merrill and Woods on bread made from finer grades of flour, 631.
- Mertens on gastric carcinoma, 184.
- Mesenteric glands, tubercle bacilli in, 30; glands, tuberculosis of, in children, 248; vessels, embolism of, 158; vessels, thrombosis of, 158.
- Mesotan, 499; eruption, 435; in rheumatism, 55, 499.
- Metabolic affections, 103.
- Metabolism, 535; after administration of borax, 640; anomaly of, as cause of rickets, 277; diseases of, 81; experiments upon vegetarian, 639; in beriberi, 64; in carcinoma, 653; in chlorosis, 340; in chronic mixed leukemia, 122; in fever, 15, 634; in nephritis, 219; of phosphorus in tuberculosis, 39; physiologic chemistry, 639; proteid in fever, 634; toxic increase in, in pernicious anemia, 116.
- Metapneumonic empyema in children, diagnosis, 265.
- Metchnikoff and Roux on syphilis in anthro-poid apes, 444.
- Meteorism, changes in position of liver and thoracic organs in, 185.
- Mettler on syphilis as cause of chorea, 399.
- Metzger on menstrual iterus, 198.
- Meunier on activity of rennet ferment, 647.
- Meuse on variations in amount of potassium cyanid in saliva, 167.
- Meyer on fate of diamidoacids, 635.
- Meyer (E.) on disturbances in development of kidneys, 350; on floating liver, 201; on katatonic manifestations, 420.
- Meyer (F.) on Aronson's serum, 478.
- Meyer and Langstein on alkaptonuria, 206.
- Meynet and Pehu on dermatitis herpeticiformis in children, 429.
- Mian Mir, antimalarial operations at, 69.
- Michel on osteogenesis imperfecta, 276.
- Michel and Patein on albumoses, 645.
- Microbic poisons, 329.
- Micrococcus rheumaticus, 308.
- Micturition, frequent, as sign of chronic nephritis, 216.
- Midcerebellar artery, thrombosis of, 398.
- Middeldorp on appendicitis, 189.
- Mignon on diapason in examining organs, 160.
- Migraine, 416; and asthma, mechanism, 416; distention of stomach before attack, 416; enlargement of stomach in, 175; treatment, 416.
- Mikulicz on nucleinic acid before operations, 500.
- Milchener on pseudotubercle bacilli in bronchiectasis, 43.
- Miliary tuberculosis, acute, bovine origin, 248.
- Milk, acidity of, 231; acidulated fat-free, in gastro-enteritis of infants, 236; and infant-feeding, 230; as cause of diphtheria, 241; as cause of sore throat, 241; as source of infection of tuberculosis, 28; ash of, 640; Bacillus pseudodiphtherie in, 306; breast-, in acute enterocolitis in children, 260; breast-, in acute inflammations of digestive tract in children, 260; condensed, as cause of tuberculosis in children, 248; condensed, quality, 612; elements of, in infant-feeding, idiosyncrasies for, 236; fat in, quantity of, 233; ferments in, 231, 640; freezing-point, lowering, 640; heated, tubercle bacillus in, destruction of, 297; heating of, to destroy pathogenic organisms, 12; human, acidity of, 231; human, and milk of animal, biologic differences, 231; human, diastasic, ferment in, 232; immune, in prevention of tuberculosis, 232; infected, scarlet fever from, 589; intolerance for, in children with dyspepsia and chronic enteritis, 260; lactose of, formation, 640; modification, 235; of animals and human milk, biologic differences, 232; oxidizing ferment in, 232; physiologic chemistry, 640; pure and impure, in infant-feeding, 234; tubercle bacilli in, destruction by heating, 581; typhoid bacilli in, behavior, 12.
- Milk-poisoning, acute colitis from, 186; septic sore-throat from, 187.
- Miller on malignant endocarditis with meningitis, 144.
- Miller and Hess on acute leukemia, 120.
- Miller and Walsham on rays from muscles and nerves, 543, 544.
- Minced meat in treatment of sprue, 187, 188.
- Minelli on tumors of hypophysis without akromegaly, 406.
- Mineral-substances of tissues, loss in, in tuberculosis, 39.
- Miner's anemia, hookworm disease and, 600.
- Miners, uncinaria in, 224.
- Miodowski on tumors in and around stomach, 358.
- Mirallée and Leignen on uncontrollable vomiting in child, 272.
- Mironescu on elastic tissue in liver in infectious diseases, 356.
- Mitchell and Spiller on hysteria, 409.
- Mitral stenosis, 144; angina pectoris in, 145; edema in, 144; paralysis of recurrent laryngeal nerve in, 145.
- Mitulescu on determining amount of hemoglobin in blood, 109; on etiology of tuberculosis, 302.
- Moeller on antituberculous serum, 481.
- Mohr on influence of proteids on excretion of sugar, 90, 91; on metabolism in fever, 15, 634; on sugar-formation in diabetes mellitus, 63.
- Mohr and Dapper on metabolism in nephritis, 219.
- Moll on transformation of albumin into globulin, 645.
- Moll (L.) on gelatin as hemostatic, 494.
- Molluscum fibrosum of skin with similar condition of rectum, 433.
- Mönckeberg on normal histology and sclerosis of aortic valve, 347.
- Monery on iodine-content of thyroid, 638.
- Monkey, experimental variola in, 310.
- Monolog, insane, 421.
- Monseigneur on phlegmonous glossitis, 167.
- Montgomery (D. W.) on iodid of potassium eruption simulating epithelioma, 435; on papilloma of sole, 433; on röntgen ray in epithelioma, 432.
- Montgomery (F. H.) on actinotherapy in lupus erythematosus, 460.
- Montgomery and Bland on ethyl chlorid, 492.
- Montgomery and Scott on creasote carbonate in croupous pneumonia, 489.
- Monti (R. and A.) on gastric juice, 533.
- Monti's treatment of pertussis, 246.
- Moor, urine of, constituents, 655.
- Moore on prevention of infant mortality, 617; on registration of deaths in England, 613.
- Moore (B.) on absorption of fat, 534.
- Moore (E. J.) on sodium arsenate in tsetse-fly disease, 511.
- Moore (F. C.) on acid-intoxication sui generis, 108; on arterial thrombosis of gonorrheal origin, 58.
- Moore (J.) on iodipin in syphilis, 497.
- Moore (J. W.) on typhoid fever, 25.
- Moore (T. J.) on cramp in muscles in amebic dysentery, 192.
- Moraczewski on excretion of oxalic acid, indican, acetone, and conjugated sulfates in diabetes, 636; on urinary ammonia-excretion, 656.
- Morawitz on coagulation of blood, 110, 518.
- Morbus maculosus Werlhofii, 128.
- Morel and Chenu on iodine in parathyroids, 638.
- Moresco on adrenalin in atony of bladder, 474.
- Morgan and Barnard on phototherapy, 461.
- Mori on euquinin in prophylaxis of malaria, 493.
- Moriani (J.) on network in cancer-cells, 318.
- Moritz on blood-pressure, 151.
- Morphin, 499.

- Morphin habit, chronic, infectious dermatitis in, 436; habit, hyoscin in, 495; habit, treatment, 422; in cardiac conditions, 499.
- Morris on hemolysins in urine, 330, 627.
- Morrison on carditis in children, 267.
- Morrow on syphilis and divorce, 447.
- Morse on waste disposal, 597.
- Morse (J. L.) on antipneumococcic serum in pneumonia, 264; on diagnosis of metapneumonic empyema in children, 265; on hemo-pericardium in child, 268; on tonsillitis in children, 251; on typhoid fever in children, 238.
- Mortality from cancer in Austria, 618; from infectious diseases in Russia in 1901 and 1902, 614; from tuberculosis in European countries, 583; from tuberculosis in Greece, 583, 584; from tuberculosis in New England States, 583; from typhoid fever, 606, 607; infant, 617; in England, 618; infant, in offspring of tabetic parents, 287; milk and, 618; prevention, 617; of diphtheria, influence of serum treatment on, 244; of first four weeks of life, 275; statistics of Germany, 614.
- Morton (R.) on radium in rodent ulcer and lupus, 504.
- Morton (W. J.) on therapeutic effects of artificial fluorescence, 509.
- Mosaner on influence of diuretin and agurin on kidneys, 221.
- Moser on röntgen rays, 509.
- Moser's serum in scarlet fever, 479.
- Mosquito, destruction, 70; in transmission of yellow fever, 60.
- Mosse on lymphatic leukemia, 121.
- Mosse and Grünbaum on pernicious anemia in child, 271.
- Motor neuroses, 408; symptoms of mania and melancholia, 417.
- Motschan on red light in noma, 505.
- Mott on regeneration of nerve-fibers, 540.
- Mott and Low on sleeping-sickness, 373.
- Motta on lesions in sleeping-sickness, 75.
- Mountain sickness, physiology, 528.
- Mousseaux on renal lithiasis in children, 283.
- Mouth, diseases of, 167; mucous membrane of, psoriasis of, 430.
- Movability of heart, 146.
- Movable kidney, 218; in cyclic albuminuria in children, 282; nervous phenomena associated with, 218, 366; orthostatic albuminuria and, relation, 210; trauma as cause, 218.
- Moynihan (B. G. A.) on gastric tetany, 176.
- Much, Römer, and Siebert on ultramicroscope, 653.
- Muche as cause of tropical cutaneous myiasis in man, 426.
- Mucoids combined with other proteids, 645.
- Mucomembranous enterocolitis in Graves's disease, 98.
- Mucous membrane, gastric, islands of, 355; transitory edema of, 107; of mouth, psoriasis of, 430; of rectum in dysentery, 192.
- Mueller (A.) on gynecologic conditions as cause of intestinal disturbance, 186.
- Müller (A.) on how digestive tract protects itself from sharp bodies, 532.
- Müller (B.) on adrenalin and cocaine, 473.
- Müller (J.) on röntgen rays in skin diseases, 508.
- Müller (O.) on Koplik's spots in measles, 245.
- Mummy, ferment in muscle of, 630.
- Municipal hygiene, 597; waste, disposal of, improvements in, 597.
- Munro and McGregor on polyarthritis with hemorrhages, 105.
- Munson on plague in Philippines, 62.
- Muraschew on coagulation of blood, 518.
- Murata on anticholera serum, 477; on vaccination against cholera, 332.
- Murdoch on chronic gastric disease, 176.
- Murmur, aortic, 146; cardiopulmonary, nature and causation, 132; Flint's, 131; heart-, functional, differentiation from valvular disease in nephritis, 131; heart-, musical, origin of, 131; pseudopericardial, 131; systolic, at apex of heart, in arteriosclerosis, 131; venous, at apex of right lung, in diagnosis of tuberculosis, 38.
- Murphy (H.) on tetanus antitoxin, 513.
- Murphy (J. B.) on aspiration of cerebrospinal fluid in tetanus, 401; on osmic acid in trifacial neuralgia, 385, 500.
- Murray on salicylsulfonic acid test for albumin in urine, 654.
- Murrell on influenzal arthritis, 57; on iron, 498.
- Muscle and pancreas, combination of, decomposition of sugar by, 84; heart-, reactions to salts, 524; of mummy, ferment in, 630.
- Muscles, cramp in, in amebic dysentery, 192; intercostal, superior, movements of, in hemiplegia, 395; rays from, 543.
- Muscular atrophy, progressive, 384; atrophy, progressive spinal, in children, 287, 288; atrophy, progressive, strychnin in, 513; closure of cardia, 171; energy, action of alcohol on, 476; rigidity of spinal column, 101; rigidity of spinal column, myasthenia combined with, 102.
- Musical heart-murmurs, origin, 131.
- Musser on abdominal pain, 214.
- Muus (N.) on tumor of pleura from aberrant pulmonary tissue, 320.
- Mya on cerebrospinal meningitis, 289; on febrile attacks during infancy, 350.
- Myasthenia combined with muscular rigidity of spinal column, 102.
- Mycosis fungoides, ichthyol in, 496; röntgen rays in, 432, 455, 508.
- Myelocytes in spleen, 115.
- Myelogenous leukemia, acute, 121; in children, 269; splenic anemia and, relation, 124.
- Myeloma, bacteriology and pathology, 318; multiple, bacteriology and pathology, 318, 319.
- Myelopathic albumosuria, reactions from bone-marrow in, 208.
- Myers, Kerley, and Gieschen on acidity of cow's and human milk, 231.
- Myiasis, tropical cutaneous, 426.
- Myoclonus epilepsy, progressive, 415.
- Myogenous origin of cardiac activity, 136.
- Myoma of stomach, 358.
- Myotonia, 408.
- Myxedema, 98; acute infectious diseases as cause, 98; congenital, in children, 274; in children, 98; in children, diabetes mellitus in, 274; mental state in, 98, 403; thyroid preparations in, 98.
- Myxococcidium stegomyia, 60.
- NABARRO on sleeping-sickness, 74.
- Nabarro, Bruce, and Greig on trypanosome theory of sleeping-sickness, 73.
- Nagel on blindness from aspidium, 484.
- Nagel (J.) on Filix mas in ankylostomiasis, 227.
- Nährzucker, Soxhlet's, in infant-feeding, 235.
- Nammack (C. E.) on treatment of cerebrospinal meningitis, 393.
- Nash on red light in variola, 57, 505.
- Nasopharyngeal condition in cough, 247.
- Nathan (F.) on relation between tuberculosis and serous pleurisy in childhood, 265.
- Nathan (P. W.) on anomaly of metabolism as cause of rickets, 277.
- Nathan-Larrier on mammary tuberculosis, 297.
- Naumann on blood-pressure in phthisis, 37.
- Neck, pigmentary syphilid of, origin, 444.
- Neurobiotic blood-cells, morphologic and tinctorial changes in, 339.
- Necrosis in gout, 92; of kidney in child, after pneumonia, 283; zonal, of liver, 359.
- Neech and Hodgson on carbolic acid in variola, 57, 486.
- Negresco on unusual form of death, 547.
- Negri's protozoa in production of rabies, 67.
- Negro, syphilis in, 445; tuberculosis in, 35.
- Neilson on platinum black affecting hydrolysis and synthesis of ethyl butyrate, 634.
- Neish on banana flour, 608.
- Neish and Tonkin on leprosy in Jamaica, 65; on mercuric bichlorid in leprosy, 450; on mercury chlorid in leprosy, 498.

- Neisser on wandering phlebitis, 159.
 Neisser and Derlin on lipemia in diabetes, 89, 633.
 Neisser and Halberstädter on eosin stains and phototherapy, 462.
 Nephrectomy, blood-serum after, 521.
 Nephritic hypertrophy of heart, cause, 213.
 Nephritis, 213; absence of casts in, cause, 215; acute, and simple nephritis, distinction between, 213; acute, dry hot-air in, 221; after impetiginous eczema in children, 283; blood in, 212, 213; chronic, erysipelas in, 215; chronic, frequent micturition as sign, 216; chronic, headache in, lumbar puncture in, 221; chronic, without albuminuria, 217; eye-conditions in, 216; in aortic insufficiency, 145; in child from tonsillitis, 251; in children, congenital syphilis as cause, 283.
 Nephritis, interstitial, chronic, in children, 282; interstitial, chronic, influence of drugs, baths, rest, and muscular exercise on, 220; interstitial, chronic, tetany with, in child, 287; interstitial, in children, rarity, 283.
 Nephritis, metabolic in, 219; parenchymatous, treatment, 220; pathologic and anatomic changes in healing process in, 212; simple, Bright's disease and, distinction, 213; tendon-reflexes in, 214; urotropin to prevent, in scarlatina, 240; valvular disease in, differentiation from functional heart-murmur, 131.
 Nerve, acoustic, neurofibroma of, 389; fifth cranial, sensory distribution, 386; hypoglossal, peripheral neuritis of, 393; seventh cranial, paralysis of, sign of orbicularis in, 394.
 Nerve-cells of brain in chorea, 399, 400.
 Nerve-fibers, regeneration of, 540.
 Nerves, cranial, diseases of, 384; heart, 524; heart, pathologic conditions in, 147; of ureter and bladder, 539; rays from, 543.
 Nervous and organic cardiac arrhythmia, 137; complications of typhoid fever, 22; complications of variola, 56, 364; diseases, 363; diseases, radium in, 504; diseases, strychnin in, 513; mechanism of heart, survival after somatic death, 525; phenomena associated with movable kidney, 218, 366; system after parathyroidectomy, changes in, 344; system, changes in, in pertussis, 247; system, diseases of, in children, 285; system in sleeping-sickness, 373; system, physiology, 540; system, tuberculosis of, 390; tissue extracts, 539.
 Ness on leukoderma in children, 293.
 Netter and Salomon on collargol in infectious diseases, 487.
 Neubauer and Falta on testing of aromatic acids in alkaptonuria, 623.
 Neubeck on mercury salicylate poisoning, 566.
 Neuberg and Richter on aminoacids in acute yellow atrophy of liver, 198, 623.
 Neufeld on immunity against agglutination of streptococci, 332.
 Neugebauer on adrenalin and cocaine, 472.
 Neumann on podophyllum in dislodging unicaria, 501.
 Neumann on variability of leukocytes, 335.
 Neuringer on cardiac disorders in dysentery, 192.
 Neuralgia, trifacial, 384; intracranial neurectomy for, 384; osmic acid in, 385, 500.
 Neuraht on changes in nervous system in pertussis, 247.
 Neurectomy, intracranial, for trigeminal neuralgia, 384.
 Neuritis after malaria, 68; multiple, beriberi and, 375; peripheral, of hypoglossal nerve, 393.
 Neurofibroma of acoustic nerve, 389.
 Neurofibromatosis, central, 395.
 Neuron theory, 540.
 Neuroses due to infection, 399; motor, 408; of status lymphaticus, 408.
 Neurosis, chronic, 105.
 Neurotic, Adams-Stokes disease, 141; children, hysteria in, 278; diathesis of adults, use of opium in infancy as cause, 285.
 Nevi, vascular, actinotherapy in, 460.
 New South Wales, food regulations in, 610.
 New York, greater, suicides in, 557; schools, medical inspection, 605.
 Newbecker on strychnin poisoning, 572.
 Newborn, blood of, 522; disturbances of respiration in, 261; hemorrhagic conditions in, 252; hemorrhagic disease of, blood-letting in, 253; hemorrhagic disease of, gelatin in, 253; infections of, 252; pseudodiphtheric lesions of soft palate in, 256.
 Newcomet on protecting screen for röntgen-ray treatment, 458; on röntgen rays in pulmonary tuberculosis, 508.
 Newman (E. D.) on turpentine poisoning, 568.
 Newman (G.) on typhoid fever, 12.
 Newsholme on tuberculosis, 32; on tuberculosis in England, 585.
 Nichols (A. H.) on privileged medical communications, 576.
 Nichols (J. B.) on acute leukemia, 120.
 Nichols and Wainwright on hookworm disease, 224, 600.
 Nicholson and Hamill on infections of newborn, 252.
 Nicolaisen on catarrhal icterus, 198.
 Nicoll on pneumonia in children, 263.
 Nicoll on hermophenyl in syphilis, 452.
 Niedner on staphylococcus-sepsis, 59.
 Night-sweats in tuberculosis, 37.
 Nissl on neuron theory, 540.
 Nitric acid, action on epinephrin hydrate, 648.
 Nitrites in drinking-water, 606.
 Nitrogen, distribution in molecule of proteins, 645; Kjeldahl method of determining, 638; rate of excretion, 632; ratio of dextrose to, in urine in diabetes mellitus, 636; in urine, distribution, 654.
 Nitrogenous substances in urine, 204.
 Nitroglycerin, 499.
 Nobécourt on diarrhea in children, 259.
 Nobécourt and Vitry on influence of sodium chlorid on infant's weight, 236.
 Nodules, subcutaneous fibroid, in arthritis deformans, 101.
 Noguchi and Flexner on antivenin, 482, 483; on crotalus antivenin, 651.
 Nolf on absorption of albumose, 535; on action of peptone on pulmonary vessels, 526; on effect of serum-albumin and serum-globulin on blood-corpuscles, 522; on hypoleukocytosis from albumose, 522.
 Noma, red light in, 505.
 Norfleet on bradycardia, 143.
 Norström on massage in gastrointestinal troubles, 177.
 Northrup on acute gonococcal peritonitis in children, 284; on dyspnea in pharyngeal croup, 261; on linea albicans on knees of convalescent from typhoid fever, 279; on treatment of pneumonia in children, 263.
 Nose, leukemic changes in, in lymphatic leukemia, 122.
 Notifiable diseases in Germany, 593.
 N-rays, 543, 544; physiologic action, 646.
 Nuclease, 641.
 Nucleic acid, 500; chemistry, 641; before operation, effect, 500; oxidized, 641; thymus, 641; xanthin bases, 625.
 Nutrient enema, absorption of, 631; sugar in infant feeding, 235.
 Nutrition, 611; diseases of, in children, 273; diseases of, in children, chemie composition of body after, 279.
 Nutritive requirements of infants, 233.
 Nydegger on antistreptococcus serum in puerperal sepsis, 479.
 Nyrop on erysipelas in chronic nephritis, 215.
 Oats in diabetes mellitus, 90.
 Oberdorfer on bromoform poisoning, 294.
 Obersteiner-Redlich theory of tabes, 378.
 Obliterative appendicitis, 189.
 O'Brien on Finsen light in lupus, 471.
 Ochronosis in alkaptonuria, 206.
 Offer on acetoneuria, 108.
 Ogg on white-lead workers, 601.

- Ohlmacher on neuroses of status lymphaticus, 408.
- Oil, castor, in typhoid fever, 26; cod-liver, in rachitis, 278; croton, poisoning from, 568; cypress, in pertussis, 246; of camphor in tuberculosis, 44; of gaultheria poisoning in child, 294; olive, 500; olive, in dysentery, 193; olive, in chronic tropical dysentery, 500; olive, in pyloric stenosis, 500.
- Oldright on effect of vaccination on death-rate, 591.
- Olein, biochemic synthesis of, 632.
- Olive oil, 500; in dysentery, 193; in chronic tropical dysentery, 500; in pyloric stenosis, 500.
- Oliver on euphthalmia, 493.
- Onuf on stain for differential leukocyte counts in counting chamber, 339.
- Onuf (B.) on features of epileptic attack, 412.
- Ophthalmoplegia in child, 291.
- Ophüls on acid-proof bacilli in pure culture in chronic subcutaneous abscess, 306.
- Opie on zonal necrosis of liver, 359.
- Opium in carditis in children, 267; poisoning, venesection in, 571; use of, in infancy, as cause of neurotic diathesis of adults, 285.
- Oppenheim on psoriasis of mucous membrane of mouth, 430.
- Oppenheim (A.) on changes in position of liver and thoracic organs in meteorism, 185.
- Oppenheim (H.) on diagnostic value of certain reflexes, 367.
- Oppler on crises of fever in tabes dorsalis, 377.
- Oppler-Boas bacilli in blood-clots in diagnosis of gastric carcinoma, 183; in gastric contents, 183; in stools in gastric hemorrhage, 184; in urine in gastric carcinoma, 184.
- Oral temperature in tuberculosis, 37.
- Orbicularis, sign of, in paralysis of seventh cranial nerve, 394.
- Organ extracts, relationship, to bacteriolytic power of blood, 327.
- Organotherapy in Addison's disease, 99.
- Orlowsky on alkalinity of blood, 109.
- Ormsby on röntgen rays in mycosis fungoides, 455.
- Ornithodoros moubata as cause of tick fever, 78.
- Orr on Henoch's purpura, 128.
- Orth on intercommunicability of human and bovine tuberculosis, 33; on origin of tuberculosis, 33.
- Orthodiagraphic method of determining size of heart, 130.
- Orthostatic albuminuria, movable kidney and, relation, 210; tachycardia, 141.
- Osborne on strophanthus, 512.
- Osborne and Mendel on poison of ricin, 651.
- Osler on Adams-Stokes disease, 141; on chronic cyanosis with polycythemia and enlarged spleen, 125; on chronic purpuric erythema, 427; on obliteration of superior vena cava, 159; on ochronosis in alkaptonuria, 206; on visceral manifestations of erythema group of skin diseases, 437.
- Osmic acid, 500; in trifacial neuralgia, 385, 500.
- Osmotic pressure of blood, 111; pressure of blood, increase in, as indication of insufficiency of kidneys, 111; pressure of blood-corpuscles and serum, 520.
- Osteitis deformans, 103; deformans, cardiac lesion in, 103; deformans in brother and sister, 103; deformans, ribs in, 103; in children, 275.
- Osteoarthropathy, hypertrophic, 104, 406; hypertrophic, acute diseases in cause, 104; hypertrophic, toxic cause, 105; pulmonary, in children, 275.
- Osteogenesis imperfecta in children, 276.
- Osteomalacia, histology, 323.
- Osteopathy, medicolegal aspects, 551.
- Oswald (K.) on embolism and thrombosis of mesenteric vessels, 158.
- Oswald on physiologic albuminuria, 655.
- Oswald on proteids of urine of children, 654.
- Ott on loss in mineral-substances of tissues in tuberculosis, 39.
- Ovary, physiology, 537; removal of, influence on blood, 537.
- Overlying in England, 559, 618.
- Overstudy, dangers of, in children, 285.
- Owen on mode of death in pneumonia, 52.
- Oxalic acid, excretion in diabetes, 636.
- Oxidizing ferment in milk, 232.
- Oxygen consumption, 529.
- Oxyuris vermicularis, 223; sapo medicatus in, 223.
- Oysters, unsound, death from, medicolegal aspects, 550.
- PAGE'S disease of umbilicus, 433.
- Pain, abdominal, 214.
- Painters, house, lead poisoning in, 601.
- Pal on gastric crises in tabes dorsalis, 171; on venous murmur at apex of right lung, 38.
- Palate, soft, pseudodiphtheric lesions of, in newborn, 256.
- Pallesthesia, 364.
- Palombani on iodine in tuberculous peritonitis, 497.
- Palsy, infantile, diagnosis, 288.
- Paltauf's serum, 478.
- Pan on ventricular extra systoles without compensatory pauses, 137.
- Pancoast on röntgen rays in keloid, 454.
- Pancreas, accessory, 361; adaptation to food, 631; and muscle, combination of, decomposition of sugar by, 84; and thyroid gland, relation, 631.
- Pancreas, carcinoma of, histogenesis, 361; diseases of, 203; diseases of, chemistry of urine in, 203; extirpation of, power of destroying sugar after, 86; glycolytic action, 85; ligation of ducts of, absorption of fat after, 633; structural changes in, relation to presence or absence of spleen, 361.
- Pancreatic digestion, arginin and lysin, end-products of, 630; enzyme, alcohol produced by, 85; juice, physiology, 533; secretion, defective, infantilism due to, 276.
- Panski on peripheral neuritis of hypoglossal nerve, 393.
- Paper, wall-, lead poisoning from, 619.
- Papillary carcinoma of renal pelvis, 354; epithelioma, 320.
- Papillas, lesions of, changes in kidneys of rabbits after, 350; of kidneys, ulcerating tuberculosis of, hematuria from, 39.
- Papilloma of sole, 433.
- Papular exudative dermatosis from pilocarpin, 436.
- Paralysis agitans after accident, 409; agitans, hyoscine in, 495, 496; bulbar, in child, 291; Erb's, operative treatment, 376; diver's, prevention, 602; facial, 394; family periodic, 371; general, and diffuse cerebral syphilis, anatomic differentiation, 419; intestinal, postoperative, physostigmin in, 500; of recurrent laryngeal nerve in mitral stenosis, 145; of seventh cranial nerve, sign of orbicularis in, 394.
- Parasites, intestinal, 222; intestinal, eosinophilia in those infected with, 222.
- Parasitic diseases of scalp, sublamina in, 452; hemoptysis from Distoma Westermanii, 165; infections, leukocyte-counts in, 223; origin of cancer, 318.
- Parasyphilitic affections, 445.
- Parathyroid and thyroid cytolytic serums, 96; gland, 406; gland, relation to exophthalmic goiter, 406.
- Parathyroidectomy, changes in nervous system after, 344.
- Parathyroids, iodine in, 638.
- Paratyphoid fever, 26; blood in, 27.
- Pardo on röntgen rays, 509.
- Parenchymatous nephritis, treatment, 220.
- Paretic dementia, 418; Bacterium coli in development of, 418; blood in, 418; etiology, 418; salt-solution in, 419; syphilis in, 418.
- Park and Holt on infant-feeding with milk, 234.
- Park, Collins, and Goodwin on dysentery bacillus group, 305.
- Parker on bronzed diabetes, 88.

- Parker, Beyer, and Pothier on yellow fever, 60.
 Parkes on treatment of consumptives in sanatoriums, 581.
 Parkinsen on perforating gastric ulcer in child, 256.
 Parotitis, meningitis in, 290.
 Paroxysmal hematuria, 206; hemoglobinuria in child, 280; tachycardia, 140.
 Partridge and Jones on guanase, 626.
 Parturition, pernicious anemia following, 117.
 Passini on pemphigus neonatorum, 292.
 Passler and Rolly on disturbances of circulation in acute infectious diseases, 135.
 Pasteur on pernicious anemia, 117.
 Patein and Michel on albumoses, 645.
 Pathology and bacteriology, 295.
 Paton and Goodall on effect of removal of thymus, 537.
 Patrikios on tuberculosis in Greece, 583.
 Patton on guaiacol carbonate in measles, 245.
 Pauli on theocin and theobromin, 514.
 Pauly on adrenalin, 648.
 Pautrier and Leredde on Finsen light in lupus vulgaris, 471.
 Pavements, street, relation to health of cities, 598.
 Paviot on feculent vomiting in tabes dorsalis, 172.
 Pavlekovic-Kapolna on general paralysis and diffuse cerebral syphilis, 419.
 Pawinsky on apocynum cannabinum, 483.
 Peacocke, Gordon, and Scott on splenic anemia, 125.
 Pearce (F. S.) on infantile palsy, 288.
 Pearce (R. M.) on somatogenic cytotoxins, 326.
 Pearson on hematuria, 207.
 Peck (H.) on red light in variola, 505.
 Pediatrics, 229.
 Peebles and Bruce on adolescent insanity, 419.
 Peham on Paltauf's serum, 478.
 Pehu and Meynet on dermatitis herpetiformis, 429.
 Pellagra, aspergillus in, 317.
 Pelvis, renal, papillary carcinoma of, 354.
 Pelzl on diazo-reaction, 204.
 Pembrey, Beddard, and Spriggs on carbon dioxide in diabetes, 529; in venous blood, 637.
 Pemphigus, contagious, acute, in newborn, 429; infectious, acute, during epizootic of foot-and-mouth disease, 430; neonatorum, 292; vegetans, 430; vulgaris, bacteriology, 429.
 Penis, syphilitic initial sclerosis of, pathology, 446.
 Pennington on röntgen rays in pruritus ani, 508.
 Pennington and Martin on adrenalin, 474.
 Pentose, Bial's reaction for, 82.
 Pentosuria, 82.
 Pepsin, hydrochloric acid and, combination, 647.
 Peptic and tryptic ferments in leukemic blood, 628.
 Peptone and adrenalin, action on systemic circulation, 526.
 Percussion of apex of lungs in tuberculosis, 36.
 Percutitan in tuberculosis, 44.
 Pereira on ascites from syphilis of liver, 200.
 Perforation in typhoid fever, 19.
 Perforative peritonitis in typhoid fever, blood-pressure at time of, 19.
 Periarthritis nodosa, 346.
 Pericarditis, 143; adrenalin in, 474; aspiration of pericardium in, 144; hemorrhagic, following pleuropneumonia, in child, 268; purulent, in children, 267.
 Pericardium, aspiration of, in pericarditis, 144; tuberculosis of, 36.
 Periosteum, acute transitory edema beneath, 106.
 Peripheral neuritis after malaria, 68; neuritis of hypoglossal nerve, 393.
 Peristalsis, influence of elystrs on, 178.
 Perithelioma of Luschka's sacral gland in childhood, 321.
 Peritoneal effusions, cytodiagnosis in, 42.
 Peritonitis, gonorrheal, acute, in children, 284; gonorrheal, chronic, in children, 284, 285; in scarlet fever, 239; perforative, in typhoid fever, blood-pressure at time of, 19; pneumococic, in children, 258; tuberculous, iodine in, 497.
 Perkins and Howard on variola, 312.
 Perlin on hemoglobin and blood-corpuscles in children, 268.
 Pernicious anemia, 116; antistreptococcal serum in, 118; enterogenous origin, 116; following parturition, 117; in children, 269, 271; individual predisposition to, 117; psychoses of, 365; toxic increase in metabolism in, 116; with marked fever and appearance of sepsis, 118.
 Perrin on pneumococic peritonitis in children, 258.
 Personal appearance, marring of, medicolegal aspects, 552.
 Perthes on röntgen rays, 506.
 Pertussis, abortive, 246; and scurvy combined, 247; aristochin in, 483; bacilli, occurrence, 309; bronchopneumonia in, open-air treatment, 246; calcium sulfid in, 486; cypress oil in, 246; depression of tongue in detection of, 246; dyspeptic, 246; equinia in, 493; formaldehyd in, 493; nervous system in, changes in, 247; pathologic anatomy, 309; pole-bacteria of Czapski in, 246, 247; treatment, 246.
 Peskind on laking of blood by ether, 520.
 Petechias in vascular disturbances, 135.
 Petit and Bierry on cytotoxins, 627.
 Petrie on relationship of leukocytes and organ extracts to bacteriolytic power of blood, 327.
 Petrushky and Pusch on *Bacterium coli* as indicator of fecal pollution, 607.
 Petterson on changes in kidneys of rabbits after lesions of papillas, 350.
 Petty on hyoscin in morphinism, 495.
 Pfahler on röntgen rays in skin diseases, 507.
 Pfahler and Burr on thrombosis of midcerebellar artery, 398.
 Pfahler and Sailer on tortuosity of aorta, 156.
 Pfister on ethyl chlorid, 492.
 Pflüger on gangrene from mercurial injections in syphilis, 450; on increased sugar-excretion after administration of glycerin, 636; on sugar formed from proteid, 636.
 Phalanges, enlargement of, in rachitis, 277.
 Pharmacology, 469.
 Pharyngeal croup, dyspnea in, treatment, 261; tuberculosis, acute primary, in child, 250.
 Phenolphthalein in diseases of children, 293.
 Phenylalanin from proteids, 643.
 Philippines, plague in, 62.
 Phlebitis, gouty, 95; wandering, 159.
 Phlegmonous gastritis and gastric carcinoma, combined, 181; glossitis, 167.
 Phosphate, rate of excretion, 632.
 Phosphaturia, 205; ammonia in, 205.
 Phosphoric-acid and uric-acid excretion in gout, relation, 93.
 Phosphorus, action on bone-marrow, 336; in rachitis, 278; metabolism of, in tuberculosis, 39.
 Phototherapeutic lamp, 461.
 Phototherapy, eosin stains and, 462; in skin diseases, 459; physical factors in, 461.
 Physical development of London school boys and girls, 603.
 Physiologic action of substances, 541.
 Physiology, 517.
 Physostigmin, 500; in postoperative intestinal paralysis, 500.
 Piassetzak on antistreptococcal serum, 329.
 Pichler on diabetes insipidus, 91.
 Pick on hemianopic hallucinations, 394.
 Pickardt on scopolamin in excessive secretion of gastric juice, 511.
 Pickles on proprietary drug eruption, 435.
 Pierson on diacetic acid in recurrent vomiting in children, 272.
 Piffard on phototherapeutic lamp, 461.
 Pigmentary syphilid of neck, origin, 444.
 Pigmentation of urine, abnormal, 205.
 Pigments, bile-, in urine, detecting, 656; peculiarities of, in icterus, 195.
 Pilcher on illuminating gas poisoning, 573.

- Pilocarpin, papular exudative dermatosis from, 436.
- Pitreo on infantile mortality in offspring of tabetic patients, 287.
- Pituitary body, physiology, 537.
- Placental site, chorioepithelioma outside, 321.
- Plague, 61; carbolic acid in, 486; in domestic animals, 61; in India, 61; in Philippines, 62; rats as carriers, 61; serum for, 477.
- Plantar reflex (sole), 368, 369.
- Plasma, blood-, proteids of, 627; blood-, volume of, 519; cells, origin, 322.
- Platinum black affecting hydrolysis and synthesis of ethyl butyrate, 634.
- Plehn on blackwater fever, 317.
- Plessi and Baccarini on suprarenal extract in atony of stomach, 474.
- Pleura, tumor of, from aberrant pulmonary tissue, 320.
- Pleural effusions, cytodiagnosis in, 42.
- Pleurisy, 162; abdominal pain in, 162; adrenalin in, 474; diaphragmatic, diagnosis, 162, 163; in children, reference to abdominal pain in, 264; leukoecetes in, 163; serous, and tuberculosis in childhood, relation, 265; tuberculous, 35; tuberculous, cytodiagnosis in, 42.
- Pleuritic effusion, Bence-Jones proteid in, 208.
- Pleuropneumonia, hemorrhagic pericarditis following, in child, 268.
- Plimmer on hydrocyanic acid from proteids, 645.
- Plique on sodium salicylate in lupus, 451.
- Plumier on action of adrenalin and peptone on systemic circulation, 526; on fall of pressure in pulmonary circulation, 527; on quantity of blood in lesser circulation, 527.
- Plummer on radium bromid in cancer, 504.
- Pneumococcus arthritis, 53; infection of respiratory tract, 53; infections, hospital epidemics of, 47; peritonitis in children, 258; septicemia, 53.
- Pneumonia, 47; alcohol in, 50; blood-cultures in, 52; cardiac toxemia of, treatment, 53; chlorid retention in, 656; complicated by meningeal symptoms, modifications in cerebrospinal fluid in, 290; croupous, creasote carbonate in, 489; croupous, formation of sequestrum in, 264; digitalis in, 492; distention of abdomen in, 50; embolism of leg after, 51; hypostatic, in children, 263; importance to community, 48; in children, 263; in children, antipneumococci serum in, 264; in children, necrosis of kidney after, 283; in children, reference to abdominal pain in, 264; in children, treatment, 263; in chorea minor in children, 254; in lymphatic leukemia, 122; lobar, in children, 263; lobar, in children, pathology, 264; mode of death in, 52; physical signs in, 50; prognosis, 52; sputum in, virulence of, 52; symptomatology, 49; thioeol in, 53; traumatic, 48; treatment, 53.
- Pneumothorax, 164; in children, 265.
- Podophyllum, 501; in dislodging uncinaria, 501.
- Poisoning, anilin, 566; antimonial and lead, from use of linotype, 435; arsenic, 569, 570; aspirin, 571; bromoform, in child, 294; carbolic-acid, alcohol as antidote in, 476; carbon monoxid, 568; carbonic acid gas, 568; copper, 566; corrosive sublimate, 566; croton oil, 568; formaldehyd, 571; formalin, 493; hyoscin, 496; illuminating gas, 568, 573; illuminating gas, 573; lead, from wall-paper, 619; lead, in house painters, 601; lead, in white-lead factories, 601; mercury, 565; mercury salicylate, 566; milk-, acute colitis from, 186; milk-, septic sore-throat from, 187; oil of gaultheria, in child, 294; opium, venesection in, 571; quinin 570; quinin sulfate, 570; strychnin, 572; sulphonal, 567; tanning liquid, 572; turpentine, 568; urotropin, 570; veronal, 516, 567.
- Pole-bacteria of Czaplewski in pertussis, 246, 247.
- Poliomyelitis, acute anterior, in children, 288.
- Polk on hemolytic action of blood-serum, 328.
- Pollacci on sulfoeyanic acid, 648.
- Pollak on scurvy and pertussis, 247.
- Pollard on necrosis of kidney after pneumonia, 283.
- Pollatscheck on respiratory passages in tuberculosis, 44.
- Polyarthritis, chronic, nature of, 99; chronic, Still's type, in child, 272; chronic tuberculous, 100; with hemorrhages, 105; with psoriasis, 105.
- Polycythemia, arsenic in, 483; associated with liver-condition, 126; chronic cyanosis with, 125; chronic cyanosis with, enlarged spleen in, 125, 126, 127; chronic cyanosis with, enlarged spleen in, differentiation from acetanilid cyanosis, 127; chronic cyanosis with symptoms, 126; of congenital heart-disease in children, 271.
- Polymorphonuclear cells in diarrhea of children, 260.
- Polymyositis, 104; primary acute, in children, 272.
- Polyneuritis, acute ascending, in children, 287.
- Poynton on rheumatism, 54.
- Poynton and Shaw on staphylococcus aureus and rheumatic fever, 308.
- Polypeptids, 621, 642; resistant, 642.
- Polyuria in diabetes insipidus, secale in, 91; strychnin in, 91.
- Pontomedullocerebellar space, tumors of, 395.
- Popp on vinegar, 609.
- Porcher on lactose of milk, 640.
- Porter on shock, 527.
- Porto Rico, anemia in, 226; filariasis in, 77; uncinariasis in, 226.
- Poscharissky on anomalies of chordæ tendinæ, 348; on elastic tissue in ventricle of heart, 348.
- Posner on albuminuria, 212.
- Posner and Gies on combination of mucoids with other proteids, 645.
- Post on parasymphilitic affections, 445.
- Postfebrile Adams-Stokes disease, 141.
- Postmortem bacteriologic examinations of blood, 303; examination, medicolegal aspects, 550; hemisystole, 139.
- Posttyphoid sepsis, 21; thyroiditis, 21.
- Potassium cyanid in saliva, variations in amount, 167; iodid in thoracic aneurysm, 158, 496; iodid in tuberculosis, 496; myronate, ferment in liver capable of hydrolyzing, 633; permanganate, 501; permanganate in erysipelas, 501; permanganate in hyperidrosis of feet, 501.
- Potatoes in diabetes mellitus, 90.
- Pothier, Parker, and Beyer on yellow fever, 60.
- Potter on relation of proteids to edema in marantic children, 276.
- Pottevin on biochemic synthesis of olein, 632.
- Powell on life-span of guineaworm, 79.
- Praetorius on acute anterior poliomyelitis, 288.
- Prague, typhoid fever in, 16.
- Pratt on coagulation of blood, 518.
- Prausnitz and Laubert on Dunbar's antitoxin, 494.
- Precipitation method for detecting human blood, 573.
- Precipitin, bothriocephalus substance in production of, 228; reaction of human and cow's lactoserum and caseoserum, 641.
- Precipitins after injection of peptic or tryptic digestion of serum-albumin, 645.
- Preisich and Heim on staining blood-plaques, 109.
- Premature birth, fetal age in, röntgen rays to assist in diagnosis, 574.
- Prepuce, adherent, reflex disturbances with, in children, 285.
- Preservatives, food, borax and boric acid, 611; sulfurous acid, 610; use of, 610.
- Pressure, high, influence on microorganisms 307.
- Preventive medicine, 579.
- Price on copper in syphilis, 448.
- Price-Jones on alimentary tuberculosis, 248.
- Price and L'Engle on oil of gaultheria poisoning in infant, 294.
- Prinzling on cancer mortality in Austria, 618; on tuberculosis in European countries, 58.

- Prip on cow's udder for increasing mammary secretion, 230.
- Prisons, tuberculosis in, 585.
- Probst on tuberculosis in schools, 43.
- Produce, sewage-farm, 607.
- Progressive muscular atrophy, 384.
- Proprietary drug eruptions, 435.
- Prosecutors and witnesses, allowances to, in criminal proceedings, 577.
- Prostatic crises in tabes, 379, 380; hypertrophy, beginning, anatomic investigations on, 349.
- Protamins, 643; physiologic chemistry, 623; structure, 644.
- Proteid catabolism, 627; decomposition, increased, in febrile diseases, 634; metabolism in fever, 634; regeneration of, 639; requirement, minimum, of man, 639; substances in urine, 208; sugar formed from, 636; vegetable, 631.
- Proteids, 645; absent from feces, 631; biologic test for, 646; cell-, fat formed from, 632; deficient, in infant-feeding, 233; from egg of herring, analysis, 645; hydrocyanic acid from, 645; in urine of children with cyclic albuminuria, 654; influence on excretion of sugar, 90, 91; influence on gastric secretion, 177; nitrogen distribution in molecule of, 645; of blood-plasma, 627; phenylalanin from, 643; relation to edema, in marantic children, 276; ultramicroscope in examining, 653; ultramicroscopic appearance, 653.
- Proteus infection, agglutination of typhoid bacilli in, 331.
- Proteolysis, gastric, 169.
- Proteolytic power of combined gland extracts, 630.
- Protozoa in tropical ulcer, 316; tropical ulcer, 427; Negri's, in production of rabies, 67.
- Protozoan-like bodies in scarlet fever, 315.
- Prout and Clark on status epilepticus, 415.
- Pruritus, 441; ani, 442; ani, röntgen rays in, 508; ani with hemorrhoids, treatment, 443; carbolic acid in, 442; from auricular eczema, treatment, 442; localized, 442; localized, treatment, 442; in children, 442; in children, lactic acid in, 442; of vulva, treatment, 441; serotal, 443; senile, 443; senile, treatment, 443; treatment, 441.
- Pryn on measuring pressure in right auricle of heart, 130.
- Pseudo-chorea, 254.
- Pseudodiphtheria, bacillus, in milk, 306.
- Pseudodiphtheritic lesions of soft palate in newborn, 256.
- Pseudoglobulin, 208.
- Pseudo-hemisyctole, 139.
- Pseudoleukemia, 113; röntgen rays in, 114, 510; and leukemias, scheme for classification of, 341.
- Pseudopericardial murmurs, 131.
- Pseudotubercle bacilli in bronchiectasis, 43.
- Psoriasis of mucous membrane of mouth, 430; polyarthritides with, 105.
- Psychoneuroses, 409.
- Psychoses, Graves' disease and, relation, 97; of pernicious anemia, 365.
- Ptyalin, digestive power of, action of salts on, 532.
- Puberty, albuminuria of, 209.
- Public hygiene, 579.
- Public-house floors, tubercle bacilli on, 585.
- Puerperal eclampsia, thyroid extract in, 515; sepsis, antistreptococcus serum in, 479; sepsis, collargol in, 488.
- Pulmonary artery, congenital dilation of, in children, 266; artery, left, stenosis of, 158; osteoarthropathy in children, 275.
- Pulse, influence of excitation of hearing, taste, and smell upon, 136; intermittent, 524; irregular, 138; reflex depression of, 136; slowing of, in icterus, cause, 197; venous, in veins of forearms, in atrophic cirrhosis of liver, 199.
- Pulse-rate, exercise and, 524.
- Pulsus paradoxus, 139.
- Puncture, lumbar, 374; in cerebellar tumor in child, 291; in hydrocephalus, 399.
- Punton on Freeman family, 575; on medical malinger, 576.
- Pupils, dilation of, euphthalmia for, 493; reflex immobility of, in diabetes insipidus, 91.
- Purdon on cadmium iodid in acne rosacea, 451.
- Purgen in diseases of children, 293.
- Purges, saline, 510.
- Purin substances, action of, 324.
- Purin-bodies, diet free from, in gout, 93.
- Purpura hæmorrhagica fulminans, 253; Henoch's, 128; Henoch's, diagnosis of intussusception for, 253; lymphatic leukemia with, 440; simplex, Bacterium coli as cause, 253.
- Purpuric erythema, chronic, 427.
- Purulent pericarditis in children, 267.
- Pusch and Petruschky on Bacterium coli as indicator of fecal pollution, 607.
- Pusey on action of x-ray, 457; on radium, 466, 504.
- Pusey and Caldwell on röntgen rays in tuberculous adenitis, 508.
- Putnam on cardiopulmonary murmur, 132.
- Putnam and Elliott on tumor of spinal cord, 380.
- Pyelitis as cause of remittent fever in children, 280.
- Pyemia, gonorrheal, in children, 285.
- Pylorus, adenomyoma of, 357; stenosis of, benign, thiosinamin in, 180; stenosis of, cicatricial, thiosinamin in, 515; stenosis of, hypertrophic, in children, diagnosis, 256; stenosis of, olive oil in, 500.
- Pyonephrosis, helmitol in, 495.
- QUIL (R. H.) on quinin sulfate poisoning, 570.
- Quinke on syphilitic aneurysm of aorta, 157; on syphilitic disease of abdominal lymph-glands, 200.
- Quinke and Gross on acute localized edema, 106.
- Quinic acid, 501; in gout, 501.
- Quinin, 501; action on bone-marrow, 336; and salicylic acid in malaria, 70; in hay-fever, 501; in malaria, 70; in Ménière's disease, 501; poisoning, 570; prophylaxis, Koch's, in malaria, 69; sulfate poisoning, 570.
- RABIES, 67; extinction of, in Great Britain, 591; Negri's protozoa in production of, 67.
- Rachitic dactylitis, 277; form of feeble-mindedness, 278, 279.
- Rachitis as cause of abnormal mental development, 278; cod-liver oil in, 278; enlargement of phalanges in, 277; from coxa vara, 278; glycerinated bone-marrow in, 279; phosphorus in, 278.
- Radium, 501; action on colloids, 646; bromid in cancer, 504; bromid in skin diseases, 467; effect on bacterial growth, 503; effect on eyes, 502; in cancer, 504; in cancerous stricture of esophagus, 504; in gastric carcinoma, 184; in inoperable cancer, 503; in lupus, 503; in lupus verrucosus, 468; in lupus vulgaris, 468; in nervous diseases, 504; in rodent ulcer, 504; in skin diseases, 464; 503; in skin diseases, 503; physiologic action, 646; rays, effect on lecithin, 542; rays, effect on tissues, 502, 541; salts, physical properties and medical uses, 464; salts, rays from, röntgen rays and, comparison of treatment with, 465; therapeutic possibilities, 466, 468.
- Raehmann on observations on glycogen, proteids, and bacteria by means of ultramicroscope, 653.
- Rafferty (T. N. and H. N.) on Bilharzia hæmatobia in body, 79.
- Rahn on dionin, 492.
- Railroad companies providing medical care, medicolegal aspects, 551; transporting insane persons, medicolegal aspects, 552.
- Railway engineers, visual requirements, 601.

- Raimann on *Bacterium coli* in development of paretic dementia, 418.
 Rales in diagnosis of tuberculosis, 40.
 Ramond on blood-serum agglutinates fat, 632.
 Ramond and Flandrin on fat split before absorption, 633.
 Ramus on nature of diabetes, 85.
 Rankin on gelatin in aortic aneurysm, 157.
 Ransom on röntgen rays in pulmonary tuberculosis, 508.
 Ransom, Garrison, and Stevenson on intestinal parasites, 222.
 Rasumofsky on craniotabes, 277.
 Rathery and Castaigne on action exercised in vitro by solutions of sodium chlorid on renal epithelium, 351; on injurious action exercised in vitro on renal epithelium by serums, 351.
 Rats as carriers of plague, 61.
 Rattlesnake, venom of, 651.
 Rautenberg on antiperistalsis of stomach, 171.
 Raven on adrenalin in Addison's disease, 475.
 Ravenel on bovine and human tuberculosis, 247; on passage of tubercle bacilli through intestinal wall, 296.
 Ravogli on reflex skin-eruptions, 435.
 Raw on bovine and human tuberculosis, 247; on primary intestinal tuberculosis in children, 302; on tabes mesenterica, 248; on tuberculosis, 34.
 Raynaud's disease, scleroderma and Addison's pigmentation associated with, 403.
 Reckzeh on irregular pulse, 138; on leukemia, 119; on lime-dust in tuberculosis, 45, 46.
 Reclus on stovaine, 512.
 Rectal alimentation, continuous, apparatus for, 180; temperature in tuberculosis, 37.
 Rectum, molluscum fibrosum of, similar condition of skin associated with, 433; mucous membrane of, in dysentery, 192.
 Red atrophy of liver, 358.
 Red light, 504; in noma, 505; in variola, 57, 504, 505.
 Reed on electric currents in removing albumin and casts from urine, 221.
 Reflex, Babinski, in epilepsy, 416; disturbances with adherent prepuce in children, 285; heel-jerk, 368; knee-jerk, 367; plantar (sole), 368, 369; skin-eruptions from morbid alterations of male urethra, 435.
 Reflexes, diagnostic value, 367; tendon-, in nephritis, 214; tendon-, in nephritis, 215; tendon-, in uremia, 215, 365.
 Refuse, house, agricultural use, 599.
 Regeneration of nerve-fibers, 540; of proteid, 639.
 Registration of deaths in England, 613.
 Regnault on red light in variola, 505.
 Rehfishch on nervous and organic cardiac arrhythmia, 137.
 Reich and Krüger on determination of ammonia in urine, 656.
 Reichert on morphin, 499.
 Reichmann on pulsus paradoxus, 139.
 Reid on mycosis fungoides, 432.
 Reilly (T. F.) on adrenalin in asthma, 161, 474.
 Reinach on whey in gastro-intestinal disease, 236.
 Reiss on atrophic lichen planus, 428.
 Reissner on myogenous origin of cardiac activity, 136; in children, pyelitis as cause, 280.
 Remouchamps on laryngeal crepitation in phthisis, 41.
 Renal affections in nurslings, 283; disease, quantity of urine passed during day and night in, 216; epithelium, action exercised in vitro by solutions of sodium chlorid on, 351; epithelium, injurious action exercised in vitro on, by serums, 351; insufficiency, intermittent, in arteriosclerosis, 155; lithiasis in children, 283; pelvis, papillary cancer of, 354; vein, left, eroded, hemorrhage from, gastric ulcer with, 357.
 Rennet ferment, activity, 647.
 Rensburg on buttermilk in infant-feeding, 236.
 Resection of cervical sympathetic, 371.
 Respiration, disturbances of, in Graves' disease, 97; disturbances of, in newborn, 261; effect of aspidospermin on, 484; physiology, 528.
 Respiratory expansion on two sides in hemiplegia, difference in, 395; sounds in children, transmission of, 262; tract, diseases of, 160; tract, diseases of, in children, 261; tract, diseases of, in tuberculosis, treatment, 44; tract, hemorrhage from, 166; tract, pneumococcal infection of, 53.
 Responsibility and crime, 558; test of, 553.
 Restlessness in apoplectic conditions, 396.
 Resuscitation in apparent death by drowning, 530.
 Retina, effect of radium on, 502; in tabes, 379.
 Retinal bloodvessels, 528.
 Reuter on anatomic conditions in death from strangulation, 547; on death from suffocation, 547.
 Reyher on pole-bacteria of Czaplewski in pertussis, 246.
 Rheumatic fever, acute, etiology, 308; fever, staphylococcus aureus and, 308; hyperpyrexia, 54.
 Rheumatism, 54; acute, and *Diplococcus rheumaticus*, 308; acute, antistreptococcus serum in, 480; acute articular, differentiation from arthritis deformans, 101; antistreptococcal serum in, 55; blood in, 54; chronic, 103; in children, 253; in children, irregular rise of temperature in, 253; in children, management, 254; in children, secondary anemia in, 270; Menzer's serum in, 480; mesotan in, 55, 499; sodium salicylate in, 511; treatment, 54.
 Rheumatoid arthritis, blood in, 100.
 Rhinitis, atrophic, ichthargan in, 496.
 Rhythm of heart, irregularities in, 136.
 Ribbert on myeloma, 320.
 Ribs in osteitis deformans, 103.
 Richardson on effects of good street paving to health of people, 598.
 Richartz on gastric tetany, 176.
 Richaud and Gley on gelatin, 494; on relation of gelatin and calcium to coagulation of blood, 628.
 Richon and Haushalter on lymphadenitis in children, 274.
 Richter on excretion of sugar, 86, 87.
 Richter and Neuberg on amidocids in acute yellow atrophy of liver, 198, 623.
 Rickets, anomaly of metabolism as cause, 277; heredity in etiology, 277.
 Ricketts and Byles on red light in variola, 505.
 Rideal on creolin, 489.
 Riebold on esophageal diverticula, 357.
 Riegel on cardiac hemisystole and cardiac bigeminal action, 139; on hyperacidity and hypersecretion, 172.
 Riesman on desquamation in typhoid fever, 15.
 Riggio on formalin, 494, 596.
 Rigidity dorsalis myopathica, 101.
 Rippe on effect of lightning, 548.
 Rist and Salomon on hereditary syphilis, 251.
 Rittershaus on collargol, 487.
 Riviere on anemia splenica infantum and anemia splenica pseudoleukemia, 270.
 Roberts on antimonial and lead poisoning from use of linotype, 435; on mediastinopericarditis, 143.
 Robertson on collargol in endopericarditis, 488.
 Robin on precipitation method for detecting human blood, 573; on treatment of pruritus, 442.
 Robinson (E. A.) on adrenalin in hemoptysis, 473.
 Robinson (W. J.) on alcohol and carbolic acid, 476.
 Rockwell on röntgen-ray dermatitis, 456.
 Rockwood on elimination of endogenous uric acid, 654; on vegetable proteid, 631.
 Rocky Mountains, spotted fever of, 70; diagnosis, 70.

- Rodent ulcer, actinotherapy in, 460; on arm, 433; radium in, 504; röntgen-rays in, 433.
- Roepeke on tuberculosis, 40.
- Roger and Garnier on thyroid gland in variola, 343.
- Rogers on fat-splitting ferments as cause of changes in canned butter, 633.
- Rogers (A. W.) on relation between Graves' disease and psychoses, 97.
- Rogers (J.) on tetanus antitoxin, 401, 514.
- Rogers (L.) on Leishman-Donovan bodies in cachectical fevers, 316.
- Rolans on signalment, 574.
- Rolleston on treatment of gastric ulcer, 179.
- Rolleston and Jex-Blake on nutritive enemata, 178.
- Rolly and Pässler on disturbances of circulation in acute infectious diseases, 135.
- Römer, Much, and Siebert on ultramicroscope, 653.
- Röntgen rays, 505; action, 457; action on formation of amylase, 646; and rays from salts of radium, comparison of treatment with, 465; dermatitis as influenced by idiosyncrasy, 456; effect on tissues, 541; effect on blood, 505; effect on eggs, 543; in acne, 507, 508; in acne vulgaris, 455; in anemia, 114; in bronchiectasis, 162; in carcinoma, 456, 507, 509; in carcinoma of breast, 506; in cutaneous blastomycosis, 456; in diagnosing infantile scurvy, 279; in eczema, 507; in epithelioma, 432, 507, 509; in examination of heart, 128; in keloid, 454; in leukemia, 124, 506, 510; in lupus vulgaris, 455; in mycosis fungoides, 432, 455, 508; in pseudoleukemia, 114, 510; in rodent ulcer, 433; in sarcoma, 507; in skin diseases, 453, 458; in splenomedullary leukemia, 123; in tuberculosis, 508; in tuberculous adenitis, 508; medicolegal aspects, 552, 574; physiologic action, 646; protecting screen in treatment with, 458; technic, 457; to assist in diagnosis of fetal age in premature birth, 574; tubes, focusing adjustment for, 458; ulcer in rabbit, histologic appearances, 457.
- Roos on splenomyelogenous leukemia, 121.
- Rosacea, actinotherapy in, 460.
- Rose (A.) on hyoscin in paralysis agitans, 495, 496.
- Rose (P.) on thoracic disease simulating abdominal trouble, 51.
- Rosenberg on urticaria from application of suprarenal extract, 436.
- Rosenfeld on determining outlines of heart, 129; on fatty degeneration, 632.
- Rosengart on chronic cyanosis with polycythemia and enlarged spleen, 127.
- Rosenheim (S.) on histologic changes of leukokeratosis buccalis, 438.
- Rosenheim (T.) on carcinoma of intestine, 194.
- Rosenheim and Arnheim on glycolysis, 637.
- Rosenheim and Tunncliffe on effect of chloroform on heart, 487.
- Rosenstein on collargol in puerperal sepsis, 488.
- Rosenthal on antidyenteric serum, 477; on dysenteric toxin, 190, 332.
- Ross (R.) on Leishman-Donovan disease, 76, 315.
- Rossi on influence of temperature on viscosity of blood-serum, 519.
- Rotch on idiosyncrasies for elements of milk, 236; on infantile scurvy, 279.
- Rotch and Dunn on pulmonary osteoarthropathy in child, 275.
- Rothschild on acidulated fat-free milk in gastro-enteritis of infants, 236.
- Rothschild (A.) on beginning prostatic hypertrophy, 349.
- Round-cell sarcoma of stomach, 358.
- Roux and Josias on treatment of tuberculosis in children, 250.
- Roux and Metchnikoff on syphilis in anthropoid apes, 444.
- Royston on fusiform bacillus and spirillum of Vincent from tonsillar ulcer, 251.
- Rubella, 245.
- Rückert on glands resembling inferior esophageal cardiac glands in upper esophagus, 355.
- Rüdiger and Hektoen on effect of calcium chlorid on hemolysis, 521.
- Rüdinger on gastric carcinoma, 184.
- Rudis-Jicinsky on action of radium and röntgen rays, 504; on röntgen rays, 509.
- Ruhemann on paralysis agitans after accident, 409.
- Ruhräh on spondylitis deformans, 102.
- Rullmann on destruction of tubercle bacilli in heated milk, 297, 581.
- Rumiantzeff on gonorrheal arthritis in child, 285.
- Rumpf on fatty content of blood and various organs, 337.
- Rupture, damages for, 555; of bloodvessels as accidental injury, 549; of spleen as cause of death in acute leukemia, 120, 121.
- Russell (C. K.) on changes in nervous system after parathyroidectomy, 344; on perforation in typhoid fever, 19.
- Russell (J. W.) on gastric ulcer, 175.
- Russell (W.) on acute appendicitis, 190.
- Russell (W. H.) on arterial sclerosis and hypertension, 152.
- Russia, mortality from infectious diseases in, in 1901 and 1902, 614.
- Rutherford on olive oil in dysentery, 193, 500.
- Rydel and Seiffer on bone sensibility, 364.
- Rzegocinski, Wrzosek, and Horoszkiewicz on anilin poisoning, 567.
- SABBRATANI on relation of calcium to coagulation of blood, 518.
- Sacconaghi on precipitins, 645.
- Sack on anthraxol in skin diseases, 452.
- Sacral gland, Luschka's, in childhood, perithelioma of, 321.
- Sagians on leukocytes in pleurisy, 163.
- Sahl's method of determining function of stomach, 168.
- Sailer and Pfahler on tortuosity of aorta, 156.
- Sakata on lymphatic vessels and glands connected with esophagus, 167.
- Salant and Meltzer on antihemolysin, 627; on blood-serum after nephrectomy, 521; on coagulation of blood, 628.
- Salge on breast-milk in acute enterocolitis in children, 260.
- Salge and Hasenkopf on agglutination in scarlet fever, 239.
- Salicylate of soda in chorea, 255.
- Salicylates in chorea in children, 254.
- Salicylic acid and quinin in malaria, 70; preparations as disinfectants of bile-passages, 202.
- Salicylsulfonic acid test for albumin in urine, 654.
- Saline purges, 510.
- Salisbury on atony of stomach, 175.
- Saliva from submaxillary glands in infants, 236; of infants converting starch into maltose, 236, 631; potassium cyanid in, variations in amount, 167.
- Salivary digestion, physiology, 532; glands, symmetric diseases of, 345.
- Salmin, hydrolytic products, 644.
- Salmon on catarrhal diphtheria, 241.
- Salomon on diagnosis of carcinoma of stomach, 181.
- Salomon and Embden on alanin causing increase in sugar-excretion, 636.
- Salomon and Netter on collargol in infectious diseases, 487.
- Salomon and Rist on hereditary syphilis in child, 251.
- Salt-free diet, effect, 640.
- Salts, action on digestive power of ptyalin, 532; and water, changes in body-weight of infants and, relation, 233; effect on urinary secretion, 539; reactions of heart-muscle to, 524; strontium, 512.
- Salt-solution, epidural injections in enuresis in children, 281; in parietic dementia, 419.
- Saltykow on multiple myeloma, 319.

- Sambon on sleeping-sickness, 74; on trypanosomes in fish, 73.
- Samgen (W.) on antistreptococcus serum in scarlet fever, 479.
- Samohrd on hemorrhagic typhoid, 19.
- Samolowicz and Abramow on biliary capillaries and icterus, 358.
- Samways on influenzal erythema scarlatiniforme, 428.
- Sanatoriums for tuberculosis, 580; advantages of treatment in, 581; in Germany, 581.
- Sandberg on Oppler-Boas bacilli in gastric contents, 183.
- Sandilands on variola and vaccination, 57.
- Sandwith on leprosy, 66; on typhoid fever in Egypt, 18; on typhus fever in Egypt, 66.
- Sanitarium treatment of phthisis, 43, 44.
- Sanitary aspect of earth-burial, 598.
- Sanitation, street-car, 597.
- Santini on chlorid retention in pneumonia, 656.
- Sapo medicatus in *Oxyuris vermicularis*, 223.
- Sapokrinin, 647.
- Sarcose, physiologic chemistry, 626.
- Sarcoma, röntgen rays in, 507; round-cell, of stomach, 358.
- Sarcomatosis cutis, 432.
- Sargent and Wallace on tetanus antitoxin, 514.
- Sarsin on strychnin nitrate in sciatica, 513.
- Satin-wood irritation, acute dermatitis from, 436.
- Saundby on gastric ulcer, 179.
- Savill on hysteric skin eruptions, 409.
- Savory on acute leukemia, 121.
- Sawada on blood-pressure in arteriosclerosis, 152.
- Saweliew on influence of adrenalin on blood-corpuscles, 521.
- Sawyer on chronic interstitial nephritis of children, 282; on mitral stenosis, 144; on potatoes in diabetes, 90.
- Scagliosi on tuberculosis of pericardium, 36.
- Scalding of legs, damages for, 555.
- Scalp, eczema of, in children, 292; parasitic diseases of, sublamina in, 452.
- Scarlatina, agglutination in, 239; and diphtheria, differential diagnosis, 240; and measles, combined infection, 244; and typhoid fever, double infection, 23, 239; antistreptococcus serum in, 240, 479; aphasia in, 240; bacteriology and pathology, 309; erysopy in, 240; edema of glottis during convalescence from, 262; from infected milk, 589; hospital isolation, 589; in European armies, 615; Mallory's Cyclaster scarlatinalis in, 315; Moser's serum in, 479; protozoan-like bodies in, 315; quarantine period, 602; second attack, 240; urotropin in, 515; urotropin to prevent nephritis in, 240.
- Scarlatiniform erythema, influenzal, 428.
- Schaefer on Menzer's serum in rheumatism, 480.
- Schäfer on tuberculosis in prisons, 585.
- Schäfer (E. A.) on death by drowning, and resuscitation, 530.
- Schäfer on copper poisoning, 566.
- Schanberg on actinotherapy, 470; on Finsen light and röntgen rays in skin diseases, 458; on Finsen treatment with London Hospital lamp, 460; on radium, 504; on röntgen rays in skin diseases, 454.
- Schein and Torök on röntgen rays in acne, 507.
- Schenck on inspiratory fibers in vagus, 529.
- Schiefferdecker and Schultze on myotonia, 408.
- Schiff (E.) on röntgen rays in cancer of breast, 506.
- Schilling on saliva from submaxillary gland in infants, 236.
- Schittenhelm on etiology of tabes, 378; on excretion of ammonia in urine, 197.
- Schleifstein on origin of giant-cell, 322.
- Schleip on epidemic of trichinosis, 71.
- Schlesinger (E.) on blood in infantile atrophy and gastroenteritis, 260.
- Schlesinger (M. H.) on adrenalin, 473.
- Schlesinger (W.) on urobilin in urine, 195.
- Schlesinger and Kaufmann on Oppler-Boas bacilli in gastric contents, 183.
- Schliep on anesthesin in seasickness, 477.
- Schlüter on tuberculin-reactions, 42.
- Schmid on metabolism in chronic mixed leukemia, 122.
- Schmid and Linser on increased proteid decomposition in febrile diseases, 634.
- Schmidt on hematuria from ulcerating tuberculosis of papillas of kidneys, 39.
- Schmidt (A.) on diagnosis of tuberculosis, 39; on Menzer's serum in rheumatism, 480.
- Schmidt (H. E.) on röntgen rays in epitheliomas, 507.
- Schmidt (L. E.) on blue light treatment of skin diseases, 463.
- Schmidt (R.) on Oppler-Boas bacillus in stools in gastric hemorrhage, 184.
- Schmitt on ferment in skin, 633.
- Schmoll on leukemia, 642.
- Schneider on origin of blood-platelets, 335.
- Schnyder on action of alcohol on muscular energy, 476.
- Scholtz on radium bromid in skin diseases, 467; on radium rays in lupus, 503.
- School boys and girls of London, physical development, 603; diseases, classification, 606; hygiene, 602; medical inspection, 603.
- School-children, stuttering and stammering in, 603.
- School-hours, effects of excessive employments out of, 602.
- Schools, Italian, prevention of infectious diseases in, 605; New York, medical inspection, 605; of Switzerland, exclusion of scholars from, 605; tuberculosis in, 43.
- School-teachers, tuberculosis among, 606.
- Schott on hemoglobin in cardiac cases, 149.
- Schridde on islands of gastric mucous membrane and glands resembling inferior esophageal cardiac glands in upper esophagus, 355.
- Schröder on arsenic in infectious chorea, 255.
- Schroeder on albuminuria, 211.
- Schuckmann on antitoxin treatment of tetanus, 400.
- Schüder on rabies, 67; on typhoid epidemics, 11.
- Schüller on primary acute polymyositis in child, 272.
- Schultes on influenza and appendicitis, 188.
- Schultz and Lewandowsky on nerves of ureter and bladder, 539.
- Schultze and Schiefferdecker on myotonia, 408.
- Schunburg on bromin as disinfectant, 594.
- Schusny on instruction in regard to sexual diseases, 603.
- Schuster on syphilis of heart, 133.
- Schut on destruction of bacteria by boiling under low pressure, 307.
- Schütze on antisteapsin, 633; on gumma of trachea, 168.
- Schwartz on papillary epithelioma, 320.
- Schwarz (C.) on massage of heart, 349.
- Schwarz (G.) on effect of radium rays on leichthin, 542.
- Schwarzkopf on tuberculosis, 32.
- Sciatica, strychnin nitrate in, 513.
- Scleroderma, 107; whitlows in, 107; with Raynaud's disease and Addison's pigmentation, 403.
- Sclerosis, arterial, 152; multiple, with dementia, 383; of aortic valve, 347; syphilitic initial, of penis, pathology, 446.
- Scopolamin, 511; in excessive secretion of gastric juice, 511.
- Scopolamin-morphine narcosis, 511.
- Scotland, ankylostomiasis in, 227.
- Scott and Montgomery on creasote carbonate in croupous pneumonia, 489.
- Scott, Peacocke, and Gordon on splenic anemia, 125.
- Serofuloderma and tuberculosis, 35.
- Serotal pruritus, 443.
- Scurvy, 127; and pertussis combined, 247; infantile, 279; infantile, röntgen rays in diagnosing, 279.
- Sea-bathing in skin diseases, 450.
- Seaman, medical care of, medicolegal aspects, 551.
- Sears on tuberculous pleurisy, 35.

- Seasickness, anesthesin in, 477.
 Seborrhæa nigra, 439.
 Secale in polyuria in diabetes insipidus, 91.
 Secretin, 534.
 Secretion, 647; gastric, abnormalities of, 172; changes in, after unilateral extirpation of kidney, 170; disturbed, absorption of albumin in, 177; internal, 536; mammary, increasing, 230; mammary, increasing, cow's udder for, 230; mammary, increasing, lactagol for, 230; mammary, increasing, thyroid gland for, 230; mammary, quality, 230, 231; of acid by kidney, 539; urinary, effect of salts on, 539.
 Secretory processes, chemic regulation, 647.
 Seegen on sugar-formation in liver, 535.
 Seemann and Kutscher on oxidized nucleic acid, 641.
 Sehr on ferment in muscle of mummy, 630.
 Seiffer and Rydel on bone sensibility, 364.
 Seiller and Breuer on influence of female castration on blood, 537.
 Seliei on mercurio-erme, 452, 453.
 Seligman and Strong on method of counting blood-corpuscles, 108.
 Seligmann on cretinism, 344.
 Sembritzki on disinfection with formalin, 593; on formaldehyd in whooping-cough, 493.
 Semilunar valves of heart, relative insufficiency of, 131.
 Senator on antihemolysin, 627; on Banti's disease, 271; on hemolytic activity of blood-serum in uremia, 217.
 Senn on röntgen rays in splenomedullary leukemia, 123.
 Sensibility of bone, tuning-fork in determining, 364.
 Sensory distribution of fifth cranial nerve, 386.
 Sepsin, 651.
 Sepsis, posttyphoidal, 21; puerperal, antistreptococcus serum in, 479; puerperal, collargol in, 488.
 Septic endocarditis, acute leukemia and, differentiation, 114; sore-throat from milk-poisoning, 187.
 Septicemia, pneumococcus, 53; staphylococcus, 59; staphylococcus, Credé's silver in, 59; staphylococcus, resemblance to typhoid fever, 59.
 Sequeira on psoriasis associated with herpes zoster, 293.
 Sequestrum, formation of, in croupous pneumonia, 264.
 Serous leptomeningitis, acute, in children, 290; meningitis in children, 290; pleurisy and tuberculosis in childhood, relation, 265.
 Serum, antidyenteric, 477; antiplague, 477; antipneumococcic, in pneumonia in children, 264; antistreptococcus, 478 (see also *Antistreptococcus serum*); antituberculous, 481; antituberculous, production of, 46; antityphoid, 482; Aronson's, 478; blood-, 574; blood-, after nephrectomy, 521; blood-, agglutinates fat, 632; blood-, albumin in, refractometric determinations of, 110; blood-, hemolytic action, 308; blood-, hemolytic activity in uremia, 217; blood-, osmotic pressure, 520; Flexner's, in summer diarrhea of children, 258; for treatment of Graves' disease, 402; Haffkine's, 477; hemolytic, 627; hemotoxic, 627; injurious action exercised in vitro on renal epithelium, 351; Jex's antityphoid, 26; Marmorek's, 482; Marmorek's, in tuberculosis, 46; Menzer's, in rheumatism, 480; Moser's, in scarlet fever, 479; Paltauf's, 477; parathyroid, 96; test for blood, 627; thyroid, 96; treatment, influence on mortality of diphtheria, 244; tuberculous, studies on, 299; Vital Brazil's, 477; Yersin's, 477.
 Serum-albumin, 208; in stomach-contents in diagnosis of gastric carcinoma, 181, 182; influence on blood-corpuscles, 522.
 Serum-diagnosis of gastric carcinoma, 184.
 Serum-globulin, influence on blood-corpuscles, 522.
 Seventh cranial nerve, paralysis of, sign of orbicularis in, 394.
 Sewage-farm produce, 607.
 Sewerage, 606.
 Sewers, removal of snow by, 599.
 Sexual characteristics, secondary, 634; diseases, instruction in regard to, 603; organs, thymus and, 536.
 Shattock and Seligmann on secondary sexual characteristics, 632.
 Shattuck on lymphatic leukemia with purpura, 440.
 Shaw (H. L. K.) on quantity of fat in cow's milk, 233; on respiratory sounds transmitted in children, 262; on saliva of infants converting starch into maltose, 236, 631.
 Shaw (W. V.) on acute rheumatism, 308.
 Shaw and Poynton on staphylococcus aureus and rheumatic fever, 308.
 Shellfish, cooking, 611.
 Shepard on characteristics of good macaroni, 611.
 Sherman (G.) on antistreptococcus serum in acute rheumatism, 55, 480.
 Sherman (H. M.) on intracranial neurectomy for trigeminal neuralgia, 384.
 Sherrington and Grünbaum on cerebral cortex, 540.
 Sherwell on mycosis fungoides, 431.
 Shield, gauze, in examining diphtheric throats, 242.
 Shiga, bacillus of, relation to summer diarrhea of children, 258.
 Shiga and Ehrlich on trypan red in trypanosoma affections, 515.
 Shock, 527; action of alcohol on, 476; adrenalin in, 474; effect of strychnin in, 513; vascular, cause, 527.
 Shoemaker on gangrene from carbolic acid, 486.
 Shropshire on hemoglobinuric fever, 68.
 Shukowski on radium, 503.
 Shuttleworth on hysteria in neurotic children, 278; on rachitic form of feeble-mindedness, 278.
 Sicard on tetanus antitoxin, 514.
 Siebert, Much, and Römer on ultramicroscope, 653.
 Siegert on rickets, 277.
 Siewert on bronchiectasis, 162.
 Sigel on gastric carcinoma, 182; on rheumatism, 54.
 Sigmoiditis, acute, 187.
 Signalment, 574.
 Silbergleit on movability of heart, 146.
 Silver, Credé's, in sepsis, 59; fluorid in erysipelas, 451; fluorid in smallpox, 451.
 Silvermann, Winton, and Bailey on adulteration of food, 609.
 Silvestrini on gonorrheal infection, 58.
 Simmonds on postmortem bacteriologic examinations of blood, 303.
 Simnitzki on arteriosclerosis, 153; on influence of carbohydrates on decomposition of albumin, 177, 178.
 Simon on disinfecting power of hot soda solutions, 594; on lumbar puncture in cerebellar tumor in child, 291.
 Simon (L. G.) on action of toxin and antitoxin of diphtheria on blood and hematopoietic organs, 330; on leukocytes in diphtheria, 243, 244.
 Simon (R. M.) on reflex disturbances with adherent prepuce, 285.
 Sinkler on nervous phenomena associated with movable kidney, 218, 366.
 Sinnhuber on muscular closure of cardia, 171.
 Sivewright on variola, 55.
 Sizemski on diphtheria antitoxin, 480.
 Skalicka on typhoid fever, 16.
 Skatol, 652.
 Skatolacetic acid, 652.
 Skatolcarbonic acid, 652.
 Skene on proprietary drug eruption, 435.
 Skin, action of, relation between action of kidneys and, 219; blastomycosis of, röntgen rays in, 456; developmental defects of, and their malignant growths, 438; diseases, 425; diseases, actinotherapy in, 459; diseases, anthrasol in, 452; diseases, blue light

- treatment, 463; diseases, eosinophilia in, 440; diseases, erythema group, visceral manifestations, 437; diseases, Finsen light in, 458, 470, 471; diseases, high-frequency currents in, 463; diseases, light therapy in, 463; diseases, mercurials in, 452; diseases of, in children, 292; diseases, phototherapy in, 459; diseases, radium in, 464, 503; diseases, radium bromid in, 467; diseases, röntgen rays in, 453, 458; diseases, sea-bathing in, 450; drug eruptions of, 434; effect of Becquerel rays on, 468; eruption from aspirin, 571; eruptions, hysteric, 409; ferments in, 633; inflammations of, 426; molluscum fibrosum of, with similar condition of rectum, 433; myiasis of, tropical, 426; neoplasms of, 430; staphylococcal infection of, in typhoid fever, 20.
- Skin-eruptions, reflex, from morbid alterations of male urethra, 435.
- Skin-lesions in variola, infectiousness of, 314.
- Skinner on dry hot-air in Bright's disease, 221.
- Sklarek on empyroform in eczema, 450.
- Skull, injuries to, 398.
- Slaughter on plague in India, 61, 62.
- Slaughter and Ferrari on antiplague serum, 477.
- Slaughter-house workmen, tuberculous infection among, 602.
- Slaughtering animals, humane methods, 612.
- Sleeping-sickness, 72; arsenous acid in, 483; enlarged lymphatic glands in, 75; lymphatic glands in, 75, 316, 374; nervous system in, 373; trypanosome theory, 73; tsetse-flies in transmission of, 74.
- Smallpox, 55 (see also *Variola*).
- Smith (A. C.) on antistreptococcal serum in variola, 57.
- Smith (A. J.) on malaria and uncinariasis, 226; on uncinariasis in Texas, 224.
- Smith (F. J.) on potassium iodid in phthisis, 496.
- Smith (G.) on diphtheria bacilli in throats of sick and well, 585.
- Smith (G. B.) on paratyphoid fever, 26.
- Smith (J.) on cyclic vomiting in child, 272.
- Smith (T.) on pathologic effects of periodic losses of blood, 335.
- Smoke, tobacco, effect on blood, 569.
- Snow on amniotic fluid as infecting agent in children, 252; on mortality of first four weeks of life, 275.
- Snow, removal of, by sewers, 599.
- Snyder on food value of alcohol, 608.
- Snyder and Ely on cerebrospinal meningitis, 57.
- Snyder and Woods on bread made from finer grades of flour, 631.
- Sobel on enlargement of phalanges in rachitis, 277.
- Soda, salicylate of, in chorea, 255; solutions, hot, disinfection with, 594.
- Sodium arsenate, 511; arsenate in tsetse-fly disease, 511; chlorid, action exercised in vitro by solutions of, on renal epithelium, 351; chlorid, influence on weight of infant, 236; chlorid of food, influence on gastric juice, 647; chlorid, regulation of intake of, in disease of heart, 150; cinnamate in locomotor ataxia, 379; salicylate, 511; salicylate in chorea, 511; salicylate in lupus, 451; salicylate in rheumatism, 511.
- Soil as transmitter of cholera and typhoid fever, 591.
- Solanum carolinense, 511; in epilepsy, 511.
- Soldiers, bacillary dysentery in, 193; *Tænia nana* in, 228.
- Sole, papilloma of, 433.
- Sole-reflex (plantar), 368, 369.
- Solly on bronchiectasis in tuberculosis, 38.
- Soltman on cypress oil in pertussis, 246.
- Somatic death, possibility of restoration of mammalian heart after, 523; survival of cardiac nervous mechanism after, 525.
- Somatogenic cytotoxins, specificity, 326.
- Somers on hay-fever antitoxin, 495.
- Sommer on osteitis deformans, 103.
- Sonorous booming of hydatid disease, 81.
- Soper on street-car sanitation, 597.
- Sore, Delhi, protozoa in, 316; throat in epidemics of diphtheria, 240; throat, milk as cause, 187, 241; veldt, 427.
- Sørensen on cerebrospinal meningitis, 289.
- Sorochowitsch on glycogen reaction of leukocytes, 115.
- Soukhanoff and Wedensky on protracted alcoholic delirium, 420.
- South Africa, typhoid fever in, 18.
- Soxhlet's Nährzucker in infant-feeding, 235.
- Spanton on cystitis in young girls, 280.
- Sparks, high-frequency, in malignant growths, 464.
- Spasm of glottis in children, 286.
- Sphygmogram taken during laughter, 136.
- Spietschka on rickets, 278.
- Spiller and Mitchell on hysteria, 409.
- Spinal column, muscular rigidity of, 101; column, muscular rigidity of, myasthenia combined with, 102; cord and brain, chemie analysis, 628; cord, arteriosclerosis of, 38; cord, changes in, in diabetes mellitus, 89, 382; cord, diseases of, 377; cord, tuberculosis of, 382; cord, tumor of, 380, 381; meninges, diseases of, 375; muscular atrophy, progressive, in children, 287, 288; nerves, diseases of, 375; subarachnoid cocainization, 487.
- Spirillum of Vincent from tonsillar ulcer, 251.
- Splashing sound in gastric atony, 175.
- Spleen, action of cantharidin on, 351; action of diphtheria toxin on, 351; action of mercuric chlorid on, 351; calves', in treatment of splenic anemia in children, 271; elastic tissue of, pathology, 342; enlarged, in chronic cyanosis with polycythemia, 125, 126, 127; functional mechanism, 342; hemolysis in animals deprived of, 328; in lienal leukemia, 122; in typhoid fever, 14; myelocytes in, 115; nucleated erythrocytes in, 115; pulp, 512; removal of, in dogs, effect of, 361; rupture of, as cause of death in acute leukemia, 120, 121.
- Splenectomy in splenic anemia, 125.
- Splenic anemia, 124; anemia, blood conditions in, 125; anemia, hemorrhage in, 124; anemia in children, 270, 271; anemia in children, calves' spleen in treatment of, 271; anemia melanoderma in, 124; anemia, myelogenous leukemia and, relation, 124; anemia, splenectomy in, 125; leukemia in young calf, 342.
- Splenomedullary leukemia, röntgen rays in, 123.
- Splenomegaly in children, syphilis and rickets in, 270.
- Splenomyelogenous leukemia, 121.
- Spondylitis deformans, 102.
- Sporadic cretinism, 98; cretinism, thyroid preparations in, 98.
- Spores, anthrax, duration of life, 307.
- Spotted fever of Rocky Mountains, 70; diagnosis, 70.
- Sprained ankle and fractured coccyx, damages for, 555.
- Spratling on epilepsy, 410.
- Spriggs, Beddard, and Pembrey on carbon dioxide in diabetes, 529; in venous blood, 637.
- Sprue, 187; antiscorbutic treatment, 188; bacteriology, 188; in Barbadoes, 187; minced meat in treatment of, 187, 188.
- Spurious tapeworm in children, 257.
- Sputum in pneumonia, virulence of, 57; method of obtaining from children, 262.
- Squire on hydatid disease of lung, 166.
- Squires on basilar meningitis, 390.
- Stab-wounds, medicolegal aspects, 556.
- Stadler on leukocyte-counts in diseases of vermiform appendix, 189.
- Stæhelin on general idiopathic edema, 107.
- Stagnin, 512, 519, 626.
- Stahl on relation of tæbes dorsalis and valvular heart-disease, 133.
- Stain, blood-, immunized antiserum for identifying, 573; eosin, and phototherapy, 462; for differential leukocyte counts in counting chamber, 339.

- Staining bacteria in sections, 324; blood-plaques, 109.
- Stamm on hypertrophic stenosis of pylorus, 257.
- Stammering and stuttering in school-children, 603.
- Stanley on sudden death in beriberi and diphtheria, 64, 375.
- Stanziale on pemphigus vegetans, 430.
- Staphylococcus aureus and rheumatic fever, 308; infection, agglutination of typhoid bacilli in, 331; infection of skin in typhoid fever, 20; septicemia, 59; septicemia, Crédé's silver in, 59; septicemia, resemblance to typhoid fever, 59; vaccine in acne, furunculosis, and sycosis, 453.
- Starch, converting of, into maltose by saliva of infants, 236, 631.
- Starchy diet, excessive, as cause of enuresis in children, 281.
- Starling and Bancroft on pancreatic juice, 533.
- Starling and Bayliss on chemic regulation of secretory processes, 647.
- Starling and Henderson on retinal bloodvessels, 578.
- State laws regarding practice of medicine, 560-564.
- Statistics, mortality, of Germany, 614; vital, 613; vital, of England, 614.
- Status epilepticus, 415; lymphaticus in children, 273; lymphaticus, neuroses of, 408.
- Steele on angina pectoris in mitral stenosis, 145.
- Stegomyia fasciata, distribution in America, 60.
- Steinberg and Lubowski on agglutination of typhoid bacilli, 331.
- Steinberg on jaundice and Grüber-Widal reaction, 331.
- Steiner on typhoid fever, 21.
- Steinert on atrophy in parts paralyzed from cerebral lesions, 396.
- Steinitz on chemic composition of body after disorders of nutrition, 279; on increased ammonia-excretion in urine, 656.
- Steinwand on röntgen rays in pseudoleukemia, 114, 510.
- Stekel on euquinin in whooping-cough, 493.
- Stelwagon on larva migrans, 441; on röntgen rays in skin diseases, 454.
- Stendel on thymus nucleic acid, 641.
- Stengel on early diagnosis in arteriosclerosis, 154.
- Stenger on injuries to skull, 398.
- Stenosis, arterial, 158; hypertrophic, of pylorus, in children, 256; mitral, 144; mitral, angina pectoris in, 145; mitral, edema in, 144; mitral, paralysis of recurrent laryngeal nerve in, 145; of left pulmonary artery, 158; of pylorus, benign, thiosinamin in, 180; of pylorus, cicatricial, thiosinamin in, 515; of pylorus, hypertrophic, in children, 256; of pylorus, olive oil in, 500.
- Stephens on antimalarial operations at Mian Mir, 69.
- Stephenson and Chaldecott on ethyl chlorid, 492.
- Stern (H.) on aerophagia, 171; on diabetic and nondiabetic glycosuria, 83.
- Stern (L.) on nerves of ureter and bladder, 539.
- Stern (R.) on agglutination-test in typhoid fever, 24.
- Stern and Körte on typhoid reaction, 24.
- Sternberg on hourglass stomach, 176.
- Stethoscope, Wetherill's, 130.
- Stevens (H. B.) on gelatin in hemorrhagic disease of newborn, 253.
- Stevens (R. H.) on Finsen light in skin diseases, 470.
- Stevens (W. M.) on tendon-reflexes in uremia, 215, 365.
- Stevenson, Garrison, and Ransom on intestinal parasites, 222.
- Stewart on agglutinins and hemolysins, 521; on quantity of blood in lesser circulation, 527.
- Stiles on ground-itch, 225; on Hymenolepis nana, 227.
- Stiles (C. W.) on uncinariasis in children, 255.
- Still's type of chronic polyarthritides in child, 272.
- Stockman on ankylostomiasis in Scotland, 227.
- Stockmann and Charteris on action of lead, mercury, phosphorus, iron, and quinin on bone-marrow, 336.
- Stoddart on motor symptoms of mania and melancholia, 417.
- Stokes on milk as cause of diphtheria and sore-throat, 241.
- Stoklasa on glycolysis, 84.
- Stoklasa and Czerny on formation of alcohol by animal tissues, 637.
- Stolkund on typhoid fever with influenza, 18.
- Stomach, antiperistalsis of, 171; atony of, 175; atony of, suprarenal extract in, 474; carcinoma of, 180, 358 (see also *Gastric carcinoma*); dilation of, 175; diseases of, 168; distention of, before migraine and epileptic attacks, 416; emptying of, physiology, 531; enlargement of, in migraine, 175; function of, Sahli's method of determining, 168; HCl-producing glands of, disease of, gout from, 94; hemorrhagic erosions of, 173; hourglass, 176; hourglass, from kyphoscoliosis, 176; inversion of cane-sugar in, 631; innervation of, 531; methods of examination, 168; myoma of, 358; nature and consistence of food as influencing length of sojourn in, 531; round-cell sarcoma of, 358; transillumination of, with fluorescin, 169; tumors of, 358; ulcer of, 174 (see also *Gastric ulcer*).
- Stomach-contents, serum-albumin in, in diagnosis of gastric carcinoma, 181, 182.
- Stomatitis in impetigo contagiosa in children, 292; membranous, recurring, with erythema exudativum multiforme, 428.
- Stone on cardiac displacement, 147.
- Stockey and Levene on proteolytic power of combined gland extracts, 630.
- Storck on radium in gastric carcinoma, 184.
- Stovaine, 512; as anesthetic, 512.
- Stover on röntgen rays in epithelioma, 509.
- Strangulation, death from, anatomic conditions in, 547.
- Strass on aristochin, 483; on hedonal, 495; on theocin, 514.
- Strauch on stab-wounds, 556.
- Strauss (A.) on epidural injections in disorders of genitourinary system, 370.
- Strauss (H.) on alimentary hypersecretion, 173; on regulation of intake of fluid and of sodium chlorid in diseases of heart, 150.
- Strauss and Chajis on refractometric determinations of albumin in body-fluids, 110.
- Strebel on electrophotocautery, 471; on high-frequency sparks in malignant growths, 464.
- Street pavements, relation to health of cities, 598.
- Street-car sanitation, 597.
- Streit on diphtheria in birds, 587.
- Streng on polymyositis, 104.
- Streptococcus, agglutination of, immunity against, 332; as cause of suppurative thyroiditis, 245; aus Chorea, 308; diarrhea in children from, 259; endocarditis, antistreptococcus serum, 479; in summer diarrhea of children, 259; scarlatinae, 239.
- Stricture of esophagus, cancerous, radium in, 504.
- Stridor, congenital laryngeal, in children, 273.
- Strong on cholera vaccine, 63, 477.
- Strong and Seligman on method of counting blood-corpuscles, 108.
- Strongyloides intestinalis, 224.
- Strontium, physiologic chemistry, 648; salts, 512.
- Strophanthus, 512; effect on heart, 491.
- Strychnin, 512; effect in shock, 513; effect on alcohol, 512; in febrile diseases, 513; in nervous diseases, 513; in polyuria in diabetes insipidus, 91; in progressive muscular atrophy, 513; nitrate in diabetes insipidus, 513; nitrate in sciatica, 513; poisoning, 572.
- Stubbert on ichthyol in tuberculosis, 496.
- Stuertz on eustrongylus infection, 80; on virulence of sputum in pneumonia, 52.
- Sturmer on thyroid extract in puerperal eclampsia, 515.

- Stuttering and stammering in school-children, 603.
- Styptol, 513; in uterine hemorrhage, 513.
- Subarachnoid cocainization, spinal, 487.
- Subcutaneous abscess, chronic, acid-proof bacilli in pure culture in, 306; administration of Heyden food-preparation, 178; fibroid nodules in arthritis deformans, 101; nutritive fat-injections 179.
- Sublamin, 513; in parasitic diseases of scalp, 452; in tinea tonsurans, 513; in tinea tonsurans in children, 293.
- Sublingual growths in infants, 256.
- Submaxillary gland in infants, saliva from, 236.
- Suffocation, death from, 547.
- Sugar, assimilation-limit, 637; capacity to assimilate, in children, 235; decomposition of, by combination of muscle and pancreas, 84; destruction of, interaction of ferments in, 637; excretion of, after injections of adrenalin and influence of artificially produced fever, 355; excretion of, alanin increasing, 636; excretion of, influence of fever and infection on, 86, 87; excretion of, influence of proteids on, 90, 91; from glycérin, 636; from proteid, 636; in diabetes mellitus, 636; in urine, quantitative estimation of, 81, 82; leucin in synthesis of, 636; nutrient, in infant-feeding, 235; power of destroying, after extirpation of pancreas, 86.
- Sugar-formation in liver, 535.
- Suicide, 556; attempt at, from typhoid bacillus, 559; from carbolic acid, 556; in greater New York in 1902, 557; in United States, 557; recovery of insurance in, 549.
- Suker on inherited syphilis, 445.
- Sulfate, rate of excretion, 632.
- Sulfates, conjugated, excretion in diabetes, 636.
- Sulfoeyanic acid, 648.
- Sulfur in joint-pains in gout, 95; physiologic chemistry, 648.
- Sulfurous acid as food-preservative, 610.
- Sumikawa on origin of arteriosclerosis, 345.
- Summer diarrhea of children, atropin in, 259; danger of contagion in baby-wards in, 259; Flexner's serum in, 258; relation of bacillus of Shiga to, 258; streptococcus in, 259.
- Sun's rays, concentrated, in cancer, lupus, and other malignant growths, 462.
- Suppuration, glycogen in, significance, 323.
- Suppurative thyroiditis due to streptococcus, 245.
- Suprarenal body, physiology, 537; extract, effects, 537; urticaria from application of, 436; spray in asthma, 161.
- Suprarenal therapy in Addison's disease, 99; tissue, grafting of, 538.
- Suprarenin, influence on blood-corpuscles, 521.
- Surgery, relation of gallbladder disease to, 202.
- Susmann on leukemia and tuberculosis, 119.
- Sutherland (G. A.) on movable kidney in cyclic albuminuria in children, 210, 282.
- Sutherland and Burrows on diagnosis of intussusception for Henoch's purpura, 253.
- Sutherland and Holland on bulbar paralysis in child, 291.
- Swallowing, physiology, 530.
- Sweat, analysis of, 648; night-, in tuberculosis, 37.
- Sweating, effect on freezing-point of blood, 648; influence on viscosity of blood, 519.
- Sweet on bacteriolytic complement, 86.
- Swinton on rays from muscles and nerves, 543.
- Switzerland, schools of, exclusion of scholars from, 605.
- Sycosis, staphylococcus vaccine in, 453.
- Syllaba on Flint's murmur, 131; on pseudo-pericardial murmurs, 131; on relative insufficiency of semilunar valves, 131; on systolic murmur at apex of heart in arteriosclerosis, 131.
- Sylvester on typhoid fever in infant, 238.
- Symes and Fisher on tuberculosis, 34.
- Symmetric diseases of lacrimal and salivary glands, 345.
- Sympathetic, cervical, resection of, 371.
- Syphilid, pigmentary, of neck, origin, 444.
- Syphilis, 444; and divorce, 447; and drug eruptions, differential diagnosis, 444; as cause of aortic aneurysm, 157; as cause of chorea, 399; cerebral, diffuse, general paralysis and, anatomic differentiation, 419; congenital, as cause of nephritis in children, 283; copper in, 448; cutaneous, ex juvantibus, diagnosis, 444; delayed secondary manifestations of, 447; gastric, 185; hereditary, 449; hereditary, in child, 251; hereditary, in child, biniodid of mercury in, 251; hereditary, treatment, 449; hermophenyl in, 452; hydrogyrum hermophenylum in, 452; hypodermatic medication in, 449; in anthropoid apes, 444; in its ethical relations, 448; in locomotor ataxia, 379; in negro, 445; in parietic dementia, 418; in splenomegaly in children, 270; inherited, 445; insontium, 447; influence of alcohol in, 445; iodipin in, 497; Justus' hemoglobin test for, 447; latent, 446; mercurial cacodylate in, 453; mercurial injections in, gangrene from, 450; mereuriot in, 452; mercurio-crème in, 452; of abdominal lymph-glands, 200; of aorta, 148; of heart, 133, 148; of intestine, 195; of liver, 200; of liver, ascites from, 200; of lungs, 166; reinfection of, 444; tabes and, relation, 133.
- Syphilitic aneurysm of aorta, 157; chancres, multiplicity, 445; hydrocephalus, 251; icterus, 198; initial sclerosis of penis, pathology, 446.
- Systoles, extra, digitalis in production of, 138; ventricular extra, without compensatory pauses, 137.
- Systolic murmur at right apex of heart in arteriosclerosis, 131.
- TABES dorsalis, 377 (see also *Locomotor ataxia*); mesenterica, 248.
- Tabetic patients, infantile mortality in offspring of, 287.
- Tachycardia, orthostatic, 141; paroxysmal, 140.
- Tactual anesthesia, postoperative, field of, 386.
- Tania, 227; filmaron in, 228; nana in soldiers, 228; solium, 222; solium, anemia from, 228; solium as cause of acute chorea in children, 255.
- Talma's operation in atrophic cirrhosis, indications, 199.
- Tammann and Chlopin on influence of high pressure on microorganisms, 307.
- Tanning fluid, poisoning from, 572.
- Tapeworm, dwarf, 227; spurious, in children, 257.
- Tappeiner on painting tissues with eosin as enhancing action of light, 471.
- Tartakowsky on inorganic iron, 638.
- Tarugi and Galdi on relation between epilepsy and acidity of urine, 414.
- Tashiro on histology of osteomalacia, 323.
- Tavel on antistreptococcic serum, 478.
- Taylor on aminoacids, 623.
- Taylor on effect of salt-free diet, 640.
- Taylor on synthesis of triolein, 633.
- Taylor (G. G. S.) on röntgen rays in rodent ulcer, 433.
- Taylor (J.) on hemierania with paralysis of third nerve, 287.
- Taylor (W. G.) on endothelioma of dura, 396.
- Taylor and Clark on facial palsy, 394.
- Tea made of birch-leaves for dissolving renal calculi, 222.
- Telangiectasis, actinotherapy in, 460.
- Temperature at which ferment is destroyed, 634; body-, daily curve, 539; daily variations in, during infancy and childhood, 275; influence on viscosity of blood-serum, 519; oral, in tuberculosis, 37; rectal, in tuberculosis, 37.
- Tendon-reflexes in nephritis, 214; in uremia, 215, 365.
- Terrien and Lamy on displacement of heart's apex in children, 267.
- Teschemacher on Dupuytren's contracture in diabetes, 87.
- Tessaro and Cagnetto on action of diuretic

- substances on excretion of bacteria through kidneys, 354.
- Test, agglutination for blood, 627; agglutination-, in typhoid fever, 24; biologic, for detecting albumin, 646; biologic for proteids, 646; for acetone in urine, 656; for blood, 626; Justus hemoglobin, for syphilis, 447; serum, for blood, 627.
- Tetanus, 400; antitoxin, 513; antitoxin treatment, 400; aspiration of cerebrospinal fluid in, 401; intraneural injection of antitoxin in, 401.
- Tetany, gastric, 176; children, 286; with chronic interstitial nephritis in child, 287.
- Tewildt on exercise and pulse-rate, 524.
- Texas, Malta fever in, 64; uncinariasis in, 224.
- Thacher and Mendel on strontium, 648; on strontium salts, 512.
- Thayer (O. V.) on concentrated sun's rays in malignant growths, 462.
- Thayer (W. S.) on heart and bloodvessels in typhoid fever, 153.
- Theatrical profession in dissemination of disease, 601.
- Theocin, 514; as diuretic, 220, 514; in cardiac dropsy in children, 293, 294; indropsy, 514.
- Therapeutics, experimental, 469.
- Thermostat, animal, 540.
- Thevenet and Weill on quality of mammary secretion, 230.
- Thienger on theocin, 220, 514.
- Thighs, abscesses on, in typhoid fever, 20.
- Thiocol in pneumonia, 53.
- Thiosinamin, 514; in benign stenosis of pylorus, 180; in cicatricial stenosis of pylorus, 515.
- Thomayer on orthostatic tachycardia, 141.
- Thompson (J. C.) on carbolic acid in plague, 486.
- Thompson (W. G.) on paroxysmal hematuria, 206.
- Thomson on skin eruptions from aspirin, 571.
- Thoracic aortic aneurysm, potassium iodid in, 158; disease simulating abdominal trouble, 51; organs, changes in position, in meteorism, 185.
- Thorel on accessory pancreas, 361; on nephritis, 212.
- Thorne and Berry on physical development of London school boys and girls, 603.
- Thorium, therapeutic value, 468.
- Thresh on diarrhea, 186.
- Thrill, hydatid, 81.
- Thrombi, bile, 359.
- Thrombosis, 158; arterial, gonorrheal origin, 58; morphology, 339; of jugular veins, 159; of mesenteric vessels, 158; of midcerebellar artery, 398.
- Throat, examination of, in diphtheria, gauze shield for, 242; primary gangrene of, in child, 256; sore, in epidemics of diphtheria, 240; milk as cause, 187, 241.
- Throat-inflammations, acute, acute thyroiditis in, 167.
- Thrush, generalized infection with, 256.
- Thumen on iodipin in syphilis, 497.
- Thymus and sexual organs, 536; in fetus, 273; nucleic acid, 641; removal of, effect, 537.
- Thyroglossal duct, tumors of, 343.
- Thyroid and parathyroid cytolytic serums, 96; extract, 515; extract in puerperal eclampsia, 515; gland, aplasia of, 343; gland, diseases of, 96; gland, enlargement of, in epilepsy, 416; gland for increasing mammary secretion, 230; gland in smallpox, 343; gland, iodine-content, 638; gland, relation of pancreas and, 631; preparations in myxedema, cretinism, and cachexia strumipriva, 98; tissue, grafting of, 538.
- Thyroiditis, acute, in acute throat-inflammations, 167; chronic, anatomicopathologic study, 342; posttyphoidal, 21; suppurative, due to streptococcus, 245.
- Tick fever, 78; *Ornithodoros moubata* as cause, 78; relation of *Filaria perstans* to, 78.
- Tiedemann on hemorrhagic infarcts of lung, 165.
- Tinea tonsurans in children, sublamins in, 293; sublamins in, 513.
- Tingvall on scarlet fever from infected milk, 589.
- Tischner on pathology of liver, 359.
- Tissue, animal, formation of alcohol by, 637; effect of radium rays on, 502; elastic, in liver, in infectious diseases, 356; elastic, in ventricle of heart, 348; elastic, of spleen, pathology, 342; mineral-substances of, loss in, in tuberculosis, 39; urate-deposits in, in gout, 92.
- Tjaden on diphtheria antitoxin, 587; on heating milk to destroy pathogenic organisms, 12.
- Tobacco smoke, effect on blood, 569.
- Todd on dysentery antitoxin, 192.
- Todd and Dutton on trypanosomiasis, 72.
- Todd, Dutton, and Christy on trypanosomiasis, 75.
- Tomaszewski on mercurial exanthems, 437.
- Tombleson on bacillus in yellow fever, 61.
- Tongue, depression of, in detection of pertussis, 246; hairy, black, 440; lymphangioma of, in child, 255; trauma of, 575.
- Tonkin and Neish on leprosy in Jamaica, 65; on mercuric bichlorid in leprosy, 450; on mercury chlorid in leprosy, 498.
- Tonsillitis, acute, mercury biniodid in aborting, 498; as cause of nephritis in child, 251; in children, 251.
- Tonsils, bacillus of influenza in, 304; ulcer of, fusiform bacillus and spirillum of Vincent from, 251.
- Toogood on gout among poor, 94.
- Tooth on typhoid-infection in camps, 12.
- Torday and Kéty on cytodagnosis in pleural and peritoneal effusions, 42.
- Török and Schein on röntgen rays in acne, 507.
- Toxemia, cardiac, of pneumonia, treatment, 53.
- Toxic increase in metabolism in pernicious anemia, 116.
- Toxicology, 565.
- Toxin, dysentery-, 190; from liver-cells, 650; intracellular, in *Bacillus pyocyaneus*, 650; physiologic chemistry, 649.
- Trachea, gumma of, 168.
- Transillumination of stomach with fluorescein, 169.
- Transitory edema, acute, 106; beneath peritoneum, 106; digestive tract, 107; of gastric mucous membranes, 107; swelling of larynx from, 106.
- Trauma as cause of movable kidney, 218; of tongue, 575.
- Traumatic cause of tabes, 378; pneumonia, 48.
- Traumatism, relation to development of tumors, 575.
- Trautmann and Kiste on Esmarch's method of disinfection with formaldehyd, 596.
- Treutlein on absence of casts in nephritis, 215.
- Trevelyan on tuberculosis of nervous system, 390.
- Trichinosis, 71; eosinophilia in, 71; eosinophilia in diagnosis of, 71; epidemic of, 71.
- Trichocephalus dispar, 222.
- Trichuris trichuria, 224.
- Trifacial neuralgia, 384; intracranial neurectomy for, 384; osmic acid in, 385, 500.
- Triolein, synthesis of, 633.
- Tripeptid, 622; synthesis of, 643.
- Tripold and Abbazia on influence of various factors on excretion of urine, 204.
- Trollenier on Heyden food-preparation, 178.
- Trophoneuroses, 402.
- Tropical cutaneous myiasis, 426; dysentery, chronic, olive oil in, 500; dysentery, Cortex granati in, 193; ulcer, protozoa in, 316, 427.
- Tropics, gout in, 95.
- Trudeau, Baldwin, and Kinghorn on tuberculin reaction, 298.
- Trusch on solanum carolinense in epilepsy, 511.
- Trypan red, 515; in trypanosoma affections, 515.
- Trypanosoma affections, trypan red in, 515; gambiense, 75.

- Trypanosome theory of sleeping-sickness, 73.
 Trypanosomiasis, 72; lymphatic glands in, 75.
 Trypsin, transformation of trypsinogen into, 630.
 Trypsinogen, transformation of, into trypsin, 630.
 Tryptic and peptic ferments in leukemic blood, 628.
 Tryptophane, 651.
 Tssetse-flies in transmission of sleeping-sickness, 74.
 Tssetse-fly disease, sodium arsenate in, 511.
 Tubby on Erb's palsy, 376.
 Tubercle bacillus, agglutination of, variations in, 296; as cause of tuberculosis, 32; bacteriolysis, 299; bovine and human, comparisons of tuberculin of, in diagnosis of bovine tuberculosis, 300; chemistry, 651; from tortoise, immunization of animals with, 46; in heated milk, destruction of, 297; in mesenteric glands, 30; milk, destruction by heating, 581; infective properties, 30; Jousset's inocopy for examining exudates for, 27; modifications of, 295; morphology, 295; passage of, through intestinal wall, 296; public-house floors, 585; tuberculin made from, 300; ubiquity of, 31, 581.
 Tubercular cirrhosis in child, 250; granuloma, double, in child, 291.
 Tuberculin reaction, diagnostic value, 42; nature and specificity, 298.
 Tuberculin made from human and bovine tubercle bacilli, 300; of human and bovine tubercle bacilli, comparisons of, in diagnosis of bovine tuberculosis, 300.
 Tuberculosis, 27; acute miliary, bovine origin, 248; acute, typhoid fever and, relation, 35; air exhaled in, 584; albuminuria in, 41; alimentary, in children, 248; among school-teachers, 606; and serous pleurisy in childhood, relation, 265; antiseptics in, 45; bacillus of (see *Tubercle bacillus*); bacteriology, 295; blood-pressure in, 37; bovine and human, in children, relation, 247, 248; bovine and human, intercommunicability, 33; bovine and human, relation, 582; bovine, and tuberculosis of udder, 249; bovine, diagnosis of, comparisons of tuberculin of human and bovine tubercle bacilli in, 300; bronchiectasis in, 38; camphor in, 44; cinnamic acid in, 487; collargol in, 488; cutaneous, in children, 293; decrease in, in New England, 584; diabetes mellitus and, relation, 87; diagnosis, 39; disorders of respiratory passages in, treatment, 44; dispensaries for, 581; enlargement of axillary glands in, 41; etiology, 27, 302; experimental, 297; expired air in, 33; formaldehyd in, 45; garlic in, 44; generalized, of glandular apparatus in child, 250; hemoptysis in, 40; hemoptysis in, amylnitrite in, 45; hemorrhages from bronchiectasis in diagnosis of, 40; ichthyol in, 44; ichthyol in, 496; immunization against, 47; in children, condensed milk as cause, 248; in children during second and third years, 249; in children from inhalation, 249; in children, raw beef-juice in, 250; in children, raw meat in, 250; in children, varicella gangrenosa and, relation, 246; in England, 585; in European armies, 615; in Greece, 583; in Greece, mortality from, 583, 584; in negro, 35; in prisons, 585; in schools, 43; in slaughter-house workmen, 602; infection in, sources, 302; inhalation-, 29, 33; intestinal, in children, 249; intestinal infection of, 28; intestinal, primary, 34; intestinal, primary, in children, 302; iodoform in, 45; laryngeal crepitation in, 41; latent, la grippe resembling, 237; leukemia and, 119; lime-dust in, 46; loss in mineral-substances of tissues in, 39; lupus and, 35; mammary, 297; Marmorek's serum in, 46; metabolism of phosphorus in, 39; method of infection in, 30; milk as source of infection, 28; mortality from, in European countries, 583; mortality from, in New England States, 583; night-sweats in, 37; of breast, 297; of genitourinary system, 302; of mesenteric glands in children, 248; of nervous system, 390; of pericardium, 36; of spinal cord, 382; of udder and tuberculosis, 249; oil of camphor in, 44; oral and rectal temperatures in, 37; origin, 300; pain in shoulder in diagnosis of, 40; pathology, 27, 295; percussion of apex of lungs in, 36; percutan in, 44; pharyngeal, acute primary, in child, 250; potassium iodid in, 496; predisposition in, 27; previous history in, 40; primary basal, 38; primary seat of infection in, 34; production of, 297; rales in diagnosis of, 40; röntgen rays in, 508; rectal and oral temperatures in, 37; sanatoriums for, 580; sanatoriums for, advantages of treatment in, 581; sanatoriums for, in Germany, 581; sanitarium treatment, 43, 44; scrofuloderma and, 35; serum for, 481; sources of infection in, 302; specific treatment, 46; symptomatology, 36; treatment, 43; treatment, specific, 46; tubercle bacillus as cause, 32; ulcerating, of papillae of kidneys, hematuria from, 39; variations in physical signs, 36; venous murmur at apex of right lung in diagnosis of, 38.
 Tuberculous adenitis, röntgen rays in, 508; disease of chest, 38; endocarditis, diagnosis, 39.
 Tuberculous meningitis, 389; peritonitis, iodine in, 497; pleurisy, 35; pleurisy, cytodagnosis in, 42; polyarthritides, chronic, 100; serums, studies on, 299.
 Tugendreich on meningoenephalitis, 290.
 Tumor, bacteriology and pathology, 318; cerebellar, in child, lumbar puncture in, 291; inorganic constituents, 653; of bone-marrow, blood in, 112; of brain, 396; of brain, hemiplegia of gradual onset in diagnosis of, 397; of brain, relief of pain in, 396; of chiasm of brain, 397; of hypophysis, akromegaly and, anatomic relation, 344; of hypophysis without akromegaly, 406; of pleura from aberrant pulmonary tissue, 320; of pontomedulloerebellar space, 395; of spinal cord, 380, 381; of stomach, 358; of thyroglossal duct, 343; physiologic chemistry, 653; relation of traumatism to development of, 575.
 Tundell on temperature in infancy and childhood, 275.
 Tuning-fork in determining sensibility of bone, 364.
 Tunncliffe and Rosenheim on effect of chloroform on heart, 487.
 Türk on arsenic in polycythemia, 483; on polycythemia associated with liver-condition, 126.
 Turmont on action of beer on typhoid bacilli, 592.
 Turner on mental condition in epilepsy, 413.
 Turpentine poisoning, 568.
 Tylenchus, 77.
 Tylosis palmae et plantae, histologic changes of leukokeratosis buccalis compared with, 438.
 Typhobacillosis, Landouzy's, 249.
 Typhoid bacillus, action of beer on, 592; agglutination of, in proteus and staphylococcus infections, 331; attempted suicide from, 559; Cambier's method of isolating, 25; chemistry, 650; effect of lemon-juice on, 592; in milk, behavior, 12.
 Typhoid fever, 11; abscesses on thigh in, 20; agglutination-test in, 24; and acute tuberculosis, relation, 35; and scarlatina double infection, 22, 239; arterial complication in, 21; bacillus of (see also *Typhoid bacillus*); blood-pressure in, 15, 26; castor oil in, 26; chills in, 22; cholecystitis in, 22; cholelithiasis in, 22; chronic, in children, intolerance for milk in, 260; complications, 18; congenital, in children, 238; course, unusual, 14; desquamation in, 15; diagnosis, 22; diarrhea in, 22; diplococcal infection in, 303; disinfection in, 595; dissemination by butter, 592; ergot in, 26; epidemic at Ithaca, 16; epidemics, 11; excreta from roadbed as cause, 11, 593; fetal, 238; from butter, 13; foudroyant, 15; heart and bloodvessels in,

- 153; hemorrhagic, 15, 19; hypoleukocytosis in, 23; in children, 237, 238; in chimpanzee, 13; in China, 17; in Egypt, 18; in European armies, 615; in India, 17; in London, 12; in Prague, 16; in South Africa, 18; influenza with, 18; intestinal hemorrhage in, 20; Jez's serum in, 26; leukocyte-count in, 23; lymph-glands in, 14; mortality from, 606, 607; nervous complications, 22; perforation in, 19; perforative peritonitis in, blood-pressure at time of, 19; prevention, 25; pustular spots in, 21; reaction, 24; resemblance of staphylococcus-sepsis to, 59; serum for, 482; soil as transmitter, 591; spleen in, 14; staphylococcal infection of skin in, 20; sudden death in, 14; symptomatology, 14; treatment, 25; urotropin in, 515; water in, 26; Widal reaction in, macroscopic methods for, 330.
- Typhus fever, 66; in Egypt, 66.
- Tyzzar on vaccinia, 311.
- UDDER, cow's, for increasing mammary secretion, 230.
- Uhlenhuth on biologic test for proteids, 646.
- Ulcer, duodenal, complicating acute eozema pustulosum, 292; of stomach, 174 (see also *Gastric ulcer*); of tonsils, fusiform bacillus and spirillum of Vincent from, 251; rodent, actinotherapy in, 460; rodent, on arm, 433; rodent, radium in, 504; rodent, röntgen-rays in, 433; röntgen ray, in rabbit, histologic appearances, 457; tropical, protozoa in, 316, 427.
- Ultramicroscope, 653; in examination of gastric juice, 648.
- Ultramicroscopic appearance of bacteria, 653; of glycocin, 653; of proteids, 653.
- Umbilicus, Paget's disease of, 433.
- Uncinaria, 224; americana, 225; in miners, 224; podophyllum in dislodging, 501.
- Uncinariasis and malaria, relation, 226; in children, 255; in Porto Rico, 226; in Texas, 224; thymol in, 225.
- Underhill on urinary indican, 656.
- United States, gout in, 95; suicide in, 557.
- Uracil, physiologic chemistry, 626.
- Uranium nitrate in lupus, 503.
- Urate-deposits in tissues in gout, 92.
- Ureine of Moor, constituents, 655.
- Uremia, abnormalities of hemolysis in, 217; acute, lumbar puncture in, 221; hemolytic activity of blood-serum in, 217; in production of abdominal pain, 214; tendon-reflexes in, 215, 365.
- Ureter and bladder, nerves of, 539.
- Urethra, male, morbid alterations of, reflex skin-eruptions from, 435.
- Urethritis, gonorrheal, ichthargan in, 496; in dysentery, 191.
- Uric acid and phosphoric acid, excretion of, in gout, relation, 93; endogenous, elimination of, 654; excretion of, effect of alcohol on, 654.
- Urinary secretion, effect of salts on, 539.
- Urine, acetone in, test for, 656; acidity of, epilepsy and, relation, 414; albumin in, salicylsulfonic acid test for, 654; ammonia in, determination, 656; ammonia-excretion in, 197, 656; ammonia-nitrogen of, in biliary calculus, 197; bile in, quantitative determination, 195; bile-pigments in, detecting, 656; black, 205; casts in, electricity in removal, 221; chemistry, in diseases of pancreas, 203; electric conductivity of, relation to its chemie composition, 655; excretion of, influence of various factors on, 204; from infants, examination, 280; green, 206; hemolysins in, 330; icteric, Fehling's solution in, reduction of, 81; in beriberi, 64; indican in, 656; indigo-red in, 656; influence of concentration of, on reactions for albumin, 203; levulose and dextrose in, coincident appearances, 82; nitrogen in, distribution, 654; nitrogenous substances in, 204; of alkaptonuria, homogentisic acid in, 623; of children with cyclic albuminuria, proteids in, 654; Oppler-Boas bacilli in, in gastric carcinoma, 184; physiologic chemistry, 654; physiology, 539; pigmentation of, abnormal, 205; proteid substances in, 208; quantity passed during day and night, in cardiac and renal diseases, 216; sugar in, quantitative estimation of, 81, 82; urobilin in, clinical determination, 195.
- Urobilin in gastric contents, 196; in urine, clinical determination, 195.
- Urotropin, 515; in scarlatina, 240, 515; in typhoid fever, 515; poisoning, 570.
- Urticaria, acute, in child, 237; from application of suprarenal extract, 436; infantile, from ingestion of egg-albumin, 436.
- Uterus, effect of adrenalin on, 541; hemorrhage from, styptol in, 513; isolated, physiology, 541.
- VACCINATION against cholera, 332, 477; and lymph, 314; effect on death-rate from other diseases than smallpox, 591; influence upon variola, 57.
- Vaccine bodies, comparative morphology, 313; cholera, method of producing, 63; staphylococcus, in acne, furunculosis, and sycosis, 453.
- Vaccinia, etiology and pathology, 311.
- Vaginitis, ichthargan in, 496.
- Vagus, inspiratory fibers in, 529.
- Vaillard on formol in hyperidrosis plantaris, 451.
- Valagussa on congenital megacolon, 274.
- Vale on röntgen rays in tuberculosis of cervical glands, 508.
- Valves, semilunar, of heart, relative insufficiency of, 131.
- Valvular cardiac disease, 144; disease in nephritis, differentiation from functional heart-murmur, 131; heart-disease and tabes dorsalis, relation, 133.
- Van Harlingen on seborrhœa nigrans, 439.
- Van Leersun on reduction of Fehling's solution in ieteric urine, 81.
- Vannini on metabolism in chlorosis, 340.
- Varicella gangrenosa and tuberculosis in children, relation, 246; varioloid, 56.
- Variola, 55; antistreptococcal serum in, 57, 479; bacteriology and pathology, 309; blood in, infectiousness of, 313; carbolic acid in, 57, 486; encephalomyelitis in, 56; etiology, 312; experimental, in monkey, 310; in European armies, 615; in fetus, 55; in Germany, 590; influence of vaccination on, 57; isolation in, 590; leukocyte reaction in, 314; leukocytosis of, 56; medicolegal aspects, 554; nervous complications, 56, 364; red light in, 57, 504, 505; relation between atmospheric temperature and prevalence of disease, 55; silver fluorid in, 451; skin-lesions in, infectiousness of, 314; thyroid gland in, 343.
- Variola-virus, Cytoryetes variolæ in skin of monkey inoculated with, 312.
- Varioloid varicella, 56.
- Vascular disturbances, petechias in, 135; nevi, actinotherapy in, 460; shock, cause, 527.
- Vasomotors of lungs, 526.
- Vaughan on antistreptococcal serum, 479; on certain granules in erythrocytes, 333; on chemistry of bacteria, 650.
- Veeder on gauze shield in examining diphtheric throats, 242.
- Vegetable foods in gout, 95; proteid, 631.
- Vegetarian, metabolism experiments upon, 639.
- Veins, diseases of, 159; jugular, thrombosis of, 159; of forearms, venous pulse in, in atrophic cirrhosis of liver, 199.
- Veldt sore, 427.
- Vena cava, superior, obliteration of, 159.
- Venesection in heart-disease, 149; in opium poisoning, 571.
- Venom of rattlesnake, 651.
- Venous murmur at apex of right lung in diagnosis of tuberculosis, 38; pulse in veins of forearms, in atrophic cirrhosis of liver, 199.
- Ventricle, fourth, ependymitis in, in diabetes insipidus, 91; of heart, elastic tissue in, 348.

- Ventricular extra systoles without compensatory pauses, 137.
 Veratric acid by oxidation of methylated adrenalin, 649.
 Verchère on pruritus of vulva, 441.
 Vermiform appendix, diseases of, leukocyte-counts in, 189.
 Veronal, 515; poisoning, 516, 567.
 Vertigo, gastric, 172.
 Vesicles, glandular, of branchiogenic organs, 343.
 Veszprémi and Jancso on periarteritis nodosa, 346.
 Vibrios, cholera-like, in human stools, 62.
 Viellard and Hallopeau on papular exudative dermatosis, 436.
 Villaret on appendicitis, 189.
 Vincent on influence of sodium chlorid of food on gastric juice, 647.
 Vincent, spirillum of, from tonsillar ulcer, 251.
 Vincent (F.) on acute colitis, 186.
 Vincent and Cramer on nervous tissue extracts, 539.
 Vineberg on collargol in puerperal sepsis, 488.
 Vinegar, 609; cider, standard of, 609.
 Visceral inflammations, acute, in children, ice-bag in, 294; manifestations of erythema group of skin diseases, 437.
 Viscosity of blood, 519, 628 (see also *Blood, viscosity of*).
 Visual requirements of railway engineers, 601.
 Vital Brazil's antiplague serum, 477.
 Vital statistics, 613; statistics in England, 614.
 Vitry and Nobécourt on influence of sodium chlorid on infant's weight, 236.
 Vocal fremitus of abdomen, 170.
 Vogel on physostigmin, 501.
 Voigt on adrenalin in hemoptysis, 473.
 Voisin on modifications in cerebrospinal fluid and cortical cells in pneumonia and bronchopneumonia, 290.
 Voisin and Duflocq on attempt at suicide with typhoid bacillus, 559.
 Volume index of blood corpuscles, 334, 520.
 Vomit, black, in children, 258; bloody, in children, 258.
 Vomiting, cyclic, in children, 272; feculent, in tabes dorsalis, 172; in nutritive enemias, 178; recurrent in children, diacetic acid in, 272; uncontrollable, in children, 272.
 Von Behring on immune milk, 232; on origin and control of tuberculosis, 27, 28.
 Von Bergmann on feeding of cystin, 630.
 Von Bokay on antistreptococcus serum in scarlet fever, 479.
 Von Bruns on röntgen rays in carcinoma, 507.
 Von Criegern on vascular disturbances, 134.
 Von den Velden and Isaac on injection of bothriocephalus substance in production of a precipitin, 228.
 Von Donath on salt-solution in parietic dementia, 419.
 Von Frendl on gonorrheal endocarditis, 58.
 Von Hansemann on malakoplakia of bladder, 349.
 Von Hleb-Koszanska on perithelioma of Luschka's sacral gland in childhood, 321.
 Von Jaksch on nitrogenous substances in urine, 204.
 Von Kétly and von Torday on cytodiagnosis in pleural and peritoneal effusions, 42.
 Von Leube on nephritis in aortic insufficiency, 145.
 Von Moraczewski on biliary calculus, 197; on splenectomy in splenic anemia, 125.
 Von Noorden on hyperacidity of gastric juice, 172; on oats in diabetes mellitus, 90.
 Von Ritter on progressive spinal muscular atrophy, 288.
 Von Seiller and Breuer on chlorosis, 116.
 Von Stejskal and Axisa on changes in gastric secretion, 170.
 Von Stenitzer on diagnosis of diaphragmatic pleurisy, 162, 163.
 Von Szekeky on duration of life of anthrax spores, 307.
 Von Tabora on absorption of albumin in disturbed gastric secretion, 177.
 Von Torday and von Kétly on cytodiagnosis in pleural and peritoneal effusions, 42.
 Vournasas on test for acetone, 656.
 Vulva, pruritus of, treatment, 441.
 Vulvovaginitis in children, 284.
 WAGNER on focusing adjustment for röntgen-ray tubes, 458.
 Wagner and Heller on intestinal tuberculosis in children, 249.
 Wainwright and Nichols on hookworm disease, 224, 600.
 Wallace and Sargent on tetanus antitoxin, 514.
 Wallis on clay pastes in eczema, 450.
 Wall-paper, lead poisoning from, 619.
 Walsh on antistreptococcic serum in pernicious anemia, 118.
 Walsham and Miller on rays from muscles and nerves, 543, 544.
 Walthard on antistreptococcus serum, 479.
 Wandering, automatic, 546; phlebitis, 159.
 Warfield on danger of contagion in baby-wards in summer diarrhea, 259.
 Warner on variola in fetus, 55.
 Warts, multiple, magnesium salts in, 433.
 Wasielewski on Cytoryetes vaccinæ, 55.
 Waste, municipal, disposal of, 597.
 Water and salts, changes in body-weight of infants and, relation, 233; in typhoid fever, 26; influence of gastric secretion, 177; nitrites in, 606; transmission of diphtheria by, 585; typhoid-polluted, effect of lemon-juice on, 592.
 Water-sheds, legal control, for prevention of pollution, 607.
 Water-supply, 606; pollution of, diarrhea from, 186; supervision, 606.
 Watson (C.) on gout, 92.
 Watson (J. W.) on bradycardia with Adams-Stokes syndrome, 142.
 Waugh on atropin in summer diarrhea in children, 259.
 Weakmindedness, legal status, 546.
 Weber (C. H.) on röntgen rays in leukemia, 124.
 Weber (F. P.) on acute leukemia and scheme for classification of leukemias and pseudo-leukemias, 341; on reaction to ferric chlorid in cirrhosis of liver, 199.
 Weber (L.) on syphilis of heart and aorta, 148.
 Weber and Birnbaum on typhoid fever, 21.
 Weber, Hutchison, and MacLeod on Bence-Jones albumosuria, 207.
 Wedensky and Soukhanoff on alcoholic delirium, 420.
 Weegall on gangrene of kidney, 219.
 Weems and Ellis on breakfast foods, 609.
 Wehmer on classification of school diseases, 606; on schools of Switzerland, 605.
 Weigert on tuberculosis, 29.
 Weight of infant, influence of sodium chlorid on, 236.
 Weil (I. S.) on polycythemia of congenital heart-disease, 271.
 Weil (L.) on mesotan, 499.
 Weil (R.) on typhoid fever, 11.
 Weil and Gilbert on acute leukemia, 340.
 Weill on gelatin in summer diarrhea of children, 259.
 Weill and Thevenet on quality of mammary secretion, 230.
 Weinzirl on changes in blood produced by high altitude, 110.
 Weiss (J.) on chronic rheumatism, 103; on quinic acid in gout, 501.
 Weiss (L.) on potassium permanganate in hyperidrosis of feet, 501.
 Weiss (S.) on iodine reaction in blood of children, 271.
 Welden on diphtheria antitoxin, 480.
 Weleminsky on tuberculosis, 30.
 Wells on effect of extracts of thyroid, kidney, and spleen on autolysis of liver, 626.
 Werlhoff's disease, 128.
 West (J. P.) on congenital stenosis of pylorus, 257.
 West (S.) on physiologic or functional albu-

- minuria, 212; on relation between gout and granular kidney, 93.
- Westcott (T. S.) on calculation of cream percentages, 237.
- Westcott (W. W.) on infant mortality in England, 618; on overlying in England, 559.
- Wetherill's stethoscope, 130.
- Whatley on sulphonal poisoning, 567.
- Wheeler on chemistry of typhoid bacillus, 650.
- Wheeler and Hutchings on typhoid epidemic, 13.
- Wherry on responsibility and crime, 558.
- Wherry and Lyon on infectious dermatitis in chronic morphinism, 436.
- Whey in gastro-intestinal disease of children, 236.
- Whitcombe, Bruce, and Lund on myelopathic albumosuria, 208.
- White on lipemia in diabetes, 89.
- White and Mendel on allantoin, 654.
- White-lead factories, lead poisoning in, 601.
- Whitelegge on industrial diseases, 600.
- Whitlows in scleroderma, 107.
- Whooping-cough (see *Pertussis*).
- Widal and Javal on parenchymatous nephritis, 220.
- Widal reaction in icterus, 24; in typhoid fever, macroscopic methods for, 330; jaundice and, 331.
- Widowitz on urotropin in scarlatina, 240, 515.
- Wiesel on Addison's disease, 99.
- Wiesinger on intermittent hydrarthrosis, 105.
- Wigham and Dixon on effect of radium on bacterial growth, 503.
- Wigmore on technic of röntgen rays, 458.
- Wilcox on adonidin, 471; on iron, 498.
- Wiley on metabolism after administration of borax, 640.
- Willard and Krotoszyner on diagnosis of lesions of kidney, 216, 217.
- Willcock on radium rays, 542.
- Wille on tetanus antitoxin, 514.
- Williams on comparison between therapeutics of Röntgen rays and rays from salts of radium, 465; on physical properties and medical uses of radium salts, 464; on treatment with radium, 503.
- Williams and Kelynnack on oral and rectal temperatures in tuberculosis, 36, 37.
- Williamson (O. K.) on lymphatic leukemia, 122.
- Williamson (R. T.) on aspirin in chorea, 484; in diabetes mellitus, 484; on changes of spinal cord in diabetes, 382; on hemiplegia of gradual onset as sign of cerebral tumor, 397; on spinal cord in diabetes mellitus, 89.
- Wills and Harrison on Finsen treatment with London Hospital lamp, 461; on röntgen rays in skin diseases, 454.
- Wilsing on agricultural use of house refuse, 599.
- Wilson (A.) on double consciousness, 546.
- Wilson (T. M.) on volume of blood corpuscles and plasma, 520.
- Wilson (W. R.) on disturbances of respiration in newborn, 261.
- Wilson and Kälteyer on sarcomatosis cutis, 432.
- Wingrave (V. W.) on iodine in chronic lymphadenitis, 497.
- Winternitz on iodipin, 497; on subcutaneous nutritive fat-injections, 179.
- Winters on rheumatism in children, 253.
- Winton, Bailey, and Silvermann on adulteration of food, 609.
- Wirgin on bactericidal and growth-retarding properties of alcohols, 596.
- Witnesses and prosecutors, allowances to, in criminal proceedings, 577.
- Witthauer and Katz on styptol, 513.
- Wohlgermuth on effect of radium rays on lecithin, 542.
- Wolbach and Ernst on morphology of tubercle bacillus, 295; on tuberculins made from tubercle bacillus, 300.
- Wolff on glycogen reaction of leukocytes, 115; on granulations of leukocytes, 114; on hematogenous origin of mast-cells, 115; on secal in polyuria in diabetes insipidus, 91.
- Wolff and Blumenthal on excretion of glycuronic acid in fever, 81.
- Wolff and Goldmann on Behrendt's method of estimating sugar in urine, 82.
- Wolsely-Lewis on mental state in myxedema, 403.
- Wood on action of apocynum cannabinum, 483; on gelatin as hemostatic, 494.
- Wood and Hoyt on effect of aspidospermin on respiration, 484.
- Woods and Merrill on bread made from finer grades of flour, 631.
- Woods and Snyder on bread made from finer grades of flour, 631.
- Woolsey on cerebral tumors, 397; on tumor of spinal cord, 381.
- Wolze on abnormalities of hemolysis in uremic conditions, 217.
- Wounds, Calmette treatment, 513; of eye, infected, collargol in, 489; stab-, medico-legal aspects, 556.
- Woyer on ichthargan in gonorrheal urethritis and gonorrheal cystitis, 496.
- Wright (A. E.) on antityphoid inoculation, 482; on staphylococcus vaccine in acne, furunculosis, and syphilis, 453.
- Wright (H.) on beriberi in monkeys, 375.
- Wright (J. H.) on protozoa in Delhi sore, 316.
- Wrzosek, Horoszkiewicz, and Rzegocinski on anilin poisoning, 566.
- Wurtz on weaning infants, 231.
- Wynn (T. B.) on digitalis, 490.
- Wynn (W. H.) on hypertrophic osteoarthropathy, 104.
- XANTHIN bases of nucleic acids, 625.
- Xanthoma, histology, 321.
- Xiphosternal crunching sound, 133.
- X-rays (see *Röntgen rays*).
- YAHZA-MIRZA on alcohol in syphilis, 445.
- Yellow fever, 60; bacillus in, 61; mosquito in transmission, 60.
- Yersin's antiplague serum, 477.
- Young on visual requirements of railway engineers, 601.
- ZABRISKIE and Collins on arteriosclerosis of spinal cord, 381.
- Zahorsky on eclampsia in children, 285; on pneumococcal infection of respiratory tract, 53; on polymorphonuclear cells and lymphocytes in diarrhea, 260.
- Zaitschek on fat-formation, 536.
- Zaoussalloy on salicylate of soda in chorea, 255, 511.
- Ziegler (K.) on aspergillus in pellagra, 317; on staining bacteria in sections, 324.
- Ziegler (W.) on HCl-hyperacidity, in gastric carcinoma, 180.
- Zikgraf on maximum production of guanidin, 645.
- Zlocisti on lactagol for increasing mammary secretion, 230.
- Zonal necrosis of liver, 359.
- Zones, Head's, of hyperalgesia, in children, 286.
- Zuber (B.) on congenital dilation of pulmonary artery, 266.
- Zuccala on digitalis in pneumonia, 491, 492.
- Zuppinger on diphtheria antitoxin, 244; on generalized tuberculosis of glandular apparatus, 250.
- Zweig and Calvo on Sahli's test-meal, 169.
- Zypkin on splenic anemia, 124.



1

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